**PCT** WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : G06F 9/06, 12/02, 17/30 — A1

(11) International Publication Number: **WO 00/03321**

(43) International Publication Date: 20 January 2000 (20.01.00)

(21) International Application Number: PCT/US99/15348

(22) International Filing Date: 7 July 1999 (07.07.99)

(30) Priority Data:

| | | |
|---|---|---|
| 09/112,131 | 8 July 1998 (08.07.98) | US |
| 09/218,257 | 22 December 1998 (22.12.98) | US |

(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant: WALKER DIGITAL CORPORATION [US/US]; One High Ridge Park, Stamford, CT 06905–1326 (US).

(72) Inventors: WALKER, Jay, S.; 124 Spectacle Lane, Ridgefield, CT 06877 (US). JORASCH, James, A.; Apartment 5G, 25 Forest Street, Stamford, CT 06901 (US). MIK, Magdalena; 10 South New Street, Greenwich, CT 06930 (US).

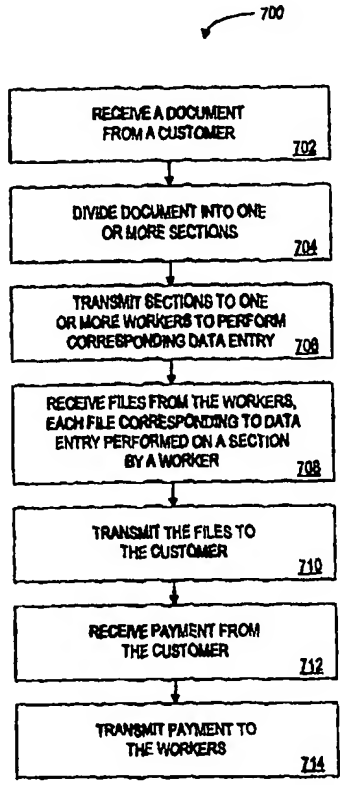
(74) Agents: ALDERUCCI, Dean et al.; Walker Digital Corporation, Intellectual Property Dept., One High Ridge Park, Stamford, CT 06905 (US).

**Published**
*With international search report.*

(54) Title: METHOD AND APPARATUS FOR PROCESSING A DOCUMENT CONTAINING CONFIDENTIAL INFORMATION

(57) Abstract

A controller receives a document (702) from a customer. The document may be an image generated by scanning a paper document. One or more sections (704) of the document that are indicated by predetermined indicia are determined. Different sections may include different types of information. For example, one section of a document might include information that identifies a person, while another section of the document might include confidential information about that person. The sections are transmitted to one or more workers (706) who perform corresponding data entry. Separating the sections can thus preserve the confidential nature of the document. A file is subsequently received from each worker. The file corresponds to data entry performed on the section of the document. The controller determines the customer associated with the file and transmits the file to the customer (710). Payment is then rendered, directly or indirectly, from the customer to the workers (714).



*FOR THE PURPOSES OF INFORMATION ONLY*

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| AL | Albania | ES | Spain | LS | Lesotho | SI | Slovenia |
| AM | Armenia | FI | Finland | LT | Lithuania | SK | Slovakia |
| AT | Austria | FR | France | LU | Luxembourg | SN | Senegal |
| AU | Australia | GA | Gabon | LV | Latvia | SZ | Swaziland |
| AZ | Azerbaijan | GB | United Kingdom | MC | Monaco | TD | Chad |
| BA | Bosnia and Herzegovina | GE | Georgia | MD | Republic of Moldova | TG | Togo |
| BB | Barbados | GH | Ghana | MG | Madagascar | TJ | Tajikistan |
| BE | Belgium | GN | Guinea | MK | The former Yugoslav Republic of Macedonia | TM | Turkmenistan |
| BF | Burkina Paso | GR | Greece | | | TR | Turkey |
| BG | Bulgaria | HU | Hungary | ML | Mali | TT | Trinidad and Tobago |
| BJ | Benin | IE | Ireland | MN | Mongolia | UA | Ukraine |
| BR | Brazil | IL | Israel | MR | Mauritania | UG | Uganda |
| BY | Belarus | IS | Iceland | MW | Malawi | US | United States of America |
| CA | Canada | IT | Italy | MX | Mexico | UZ | Uzbekistan |
| CF | Central African Republic | JP | Japan | NE | Niger | VN | Viet Nam |
| CG | Congo | KE | Kenya | NL | Netherlands | YU | Yugoslavia |
| CH | Switzerland | KG | Kyrgyzstan | NO | Norway | ZW | Zimbabwe |
| CI | Côte d'Ivoire | KP | Democratic People's Republic of Korea | NZ | New Zealand | | |
| CM | Cameroon | | | PL | Poland | | |
| CN | China | KR | Republic of Korea | PT | Portugal | | |
| CU | Cuba | KZ | Kazakstan | RO | Romania | | |
| CZ | Czech Republic | LC | Saint Lucia | RU | Russian Federation | | |
| DE | Germany | LI | Liechtenstein | SD | Sudan | | |
| DK | Denmark | LK | Sri Lanka | SE | Sweden | | |
| EE | Estonia | LR | Liberia | SG | Singapore | | |

# METHOD AND APPARATUS FOR PROCESSING A DOCUMENT CONTAINING CONFIDENTIAL INFORMATION

The present application is a continuation-in-part application of co-pending U.S. Patent Application No. 09/112,131, entitled "METHOD AND APPARATUS FOR A CRYPTOGRAPHICALLY-ASSISTED COMMERCIAL NETWORK SYSTEM DESIGNED TO FACILITATE AND SUPPORT EXPERT-BASED COMMERCE", filed on July 8, 1998, which is a continuation of U.S. Patent Application No. 08/685,706, filed July 24, 1996, each incorporated herein by reference as part of the present disclosure.

## FIELD OF THE INVENTION

The present invention relates to methods and apparatus for processing documents, and more specifically to methods and apparatus that facilitate the processing of documents containing possibly confidential information.

## BACKGROUND OF THE INVENTION

Despite the prevalence of computers and computer-related technology, a significant amount of information processing must be performed by humans rather than by computers or similar devices. For example, humans continue to be required in proof reading and amending language-translated text, especially if the translation was performed by a computer. Similarly, humans are often required in creating computer-based information, such as a text file, from a paper document or a similar document that is not computer-based. To do so, a human must typically read printing

(e.g. printed characters) on the paper document and manually type text corresponding to the printing in order to create a text file.

Computers can create text files from paper-based documents using a technique known as Optical Character Recognition ("OCR"). As is known in the art, OCR requires that an electronic device examine printed characters on the paper document, and determine the shapes of the printed characters by detecting patterns of dark and light. Then, character recognition methods are used to translate the shapes into computer text and a corresponding text file may be created and stored.

Unfortunately, OCR is often inaccurate. Any character may assume a large number of shapes, especially if the character is handwritten. To circumvent this disadvantage, some OCR systems are limited to recognizing known typefaces and sizes and cannot recognize handwriting at all. Other OCR systems use sophisticated algorithms to learn new typefaces and sizes, and may thus increase recognition accuracy somewhat. However, even the best OCR system is unable to make the common sense judgments that allow humans to recognize poorly recognizable characters and words from their context. Consequently, OCR remains unable to consistently generate accurate text files. In fact, it can take so long to proofread and correct a text file created with OCR that it would be just as easy to have a human manually create a text file by typing the text.

Unfortunately, many businesses have a great need to create computer-based information from paper documents. For example, insurance companies and other businesses in the health care field must process paper documents such as claim requests, payment receipts, new member applications and medical test results. The overwhelming majority of these paper documents are processed manually which is

extremely expensive and time consuming. Such documents may include confidential information, such as the medical information of patients. Consequently, it is undesirable to permit people to have access to these documents.

It would be advantageous to provide a method and apparatus that facilitates the creation of computer-based information from paper documents.

## SUMMARY OF THE INVENTION

It is an object of the present invention to provide a method and apparatus that facilitates the creation of computer-based information from paper documents.

In accordance with the present invention, a controller receives a document from a customer. The document may be an image generated by scanning a paper document. One or more sections of the document that are indicated by predetermined indicia are determined. Different sections may include different types of information. For example, one section of a document might include information that identifies a person, while another section of the document might include confidential information about that person. The sections are transmitted to one or more workers who perform corresponding data entry. Separating the sections can thus preserve the confidential nature of the document.

A file is subsequently received from each worker. The file corresponds to data entry performed on the section of the document. The controller determines the customer associated with the file and transmits the file to the customer. Payment is then rendered, directly or indirectly, from the customer to the workers.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic illustration of an apparatus for processing a document in accordance with the present invention.

FIG. 2 is a schematic illustration of a controller of the apparatus of FIG. 1.

FIG. 3 is a schematic illustration of a customer database of the controller of FIG. 2.

FIG. 4 is a schematic illustration of a worker database of the controller of FIG. 2.

FIG. 5 is a schematic illustration of a document database of the controller of FIG. 2.

FIG. 6 is a schematic illustration of a section database of the controller of FIG. 2.

FIG. 7 is a flow chart illustrating a method for processing a document in accordance with the present invention.

FIG. 8 is a data flow diagram illustrating the transfer of information within the apparatus of FIG. 1 during a portion of the method of FIG. 7.

FIGS. 9A, 9B, 9C and 9D are images that include indicia for identifying sections.

FIG. 10 is an exemplary image including indicia in the form of boundary lines that define the perimeters of two sections.

FIGS. 11A and 11B are schematic illustrations of sections of a document.

FIG. 12 is a flow chart illustrating an embodiment of a portion of the method of FIG. 7.

FIG. 13 is a data flow diagram illustrating the transfer of information within the apparatus of FIG. 1 during another portion of the method of FIG. 7.

FIG. 14 is a flow chart illustrating an embodiment of another portion of the method of FIG. 7.

FIG. 15 is a schematic illustration of a form for entering data.

FIG. 16 is a schematic illustration of a form database.

FIG. 17 is a flow chart illustrating a method for permitting a section to be processed by a plurality of workers.

FIG. 18 is a schematic illustration of a record of another embodiment of the section database of the controller of FIG. 2.

FIG. 19 is a flow chart illustrating a method for processing a plurality of documents in accordance with processing criteria for the plurality.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention allows a business or other entity to automatically locate and communicate with one or more workers who in turn create computer-based information (e.g. text files or data base entries) for the business from a paper document. Thus, the business need not consume resources in locating and hiring appropriate workers. The business also remains unburdened by the administrative costs associated with hiring and retaining such workers in an employment capacity.

In addition, the present invention further allows information derivable from the paper document to remain confidential even if the document is being

processed by a worker who may be untrustworthy. Thus, even sensitive documents such as medical records may be processed without compromising their confidential information.

The present invention likewise benefits people that can function as "workers" (described below) even without possessing specialized skills. A market is created for such workers, who may work at times they choose and as much as they choose. In particular, very small amounts of free time (e.g. minutes) may be spent earning pay in exchange for services rendered remotely. Thus, people can earn money during times such as lunch breaks or other periods of inactivity. Workers may furthermore maintain their anonymity, should they desire.

Referring to FIG. 1, an apparatus 100 comprises a controller 110 that is in communication with a customer device 120 and with worker devices 130 and 135. The controller 110 may communicate with the customer device 120 and the worker devices 130 and 135 via an appropriate network such as the Internet. Each of the controller 110, the customer device 120, and the worker devices 130 and 135 may comprise computers, such as those based on the Intel® Pentium® microprocessor, that are adapted to communicate via the Internet (e.g. via a modem). Any number of customer devices and worker devices may be in communication with the controller 110.

The controller 110 facilitates communication between a customer (e.g. a business) using the customer device 120 and one or more workers using worker devices such as the worker devices 130 and 135. The communication may be performed while maintaining anonymity of each party, and in fact the present invention can eliminate the need for a party to identify the other party with which it

communicates. Accordingly, the parties may form a relationship that allows confidential information to be handled efficiently and without compromise.

Referring to FIG. 2, the controller 110 comprises a processor 202, such as the Intel® Pentium® microprocessor. The processor 202 is in communication with a data storage device 204, such as an appropriate combination of magnetic, optical and/or semiconductor memory. For example, the data storage device 204 may comprise one or more of a ROM, RAM and hard disk drive. The processor 202 and the data storage device 204 may each be (i) located entirely within a single computer or other computing device; (ii) connected to each other by a remote communication medium, such as a serial port cable, telephone line or radio frequency transceiver; or (iii) a combination thereof. In one embodiment, the controller 110 may comprise one or more computers that are connected to a remote server computer for maintaining databases.

The data storage device 204 stores a program 210 for controlling the processor 202. The processor 202 performs instructions of the program 210, and thereby operates in accordance with the present invention, and particularly in accordance with the methods described in detail herein. The program 210 furthermore includes program elements that may be necessary, such as an operating system and "device drivers" for allowing the processor 202 to interface with computer peripheral devices. Appropriate device drivers and other necessary program elements are known to those skilled in the art, and need not be described in detail herein.

The storage device 204 also stores (i) a customer database 220, (ii) a worker database 230, (iii) a document database 240, and (iv) a section database 250. The databases 220, 230, 240 and 250 are described in detail below and depicted with

exemplary entries in the accompanying figures. As will be understood by those skilled in the art, the schematic illustrations and accompanying descriptions of the databases presented herein are exemplary arrangements for stored representations of information. A number of other arrangements may be employed besides those suggested by the tables shown. Similarly, the illustrated entries of the databases represent exemplary information, and those skilled in the art will understand that the number and content of the entries can be different from those illustrated herein.

Referring to FIG. 3, a table 300 represents an embodiment of the customer database 220 (FIG. 2). The table 300 includes entries 302 and 304, each defining a customer that interacts with the controller 110 (FIG. 1) to have documents processed. It will be understood by those skilled in the art that the table 300 may include any number of entries. The table 300 also defines fields for each of the entries 302 and 304. The fields specify (i) a customer identifier 320 that uniquely identifies the customer, (ii) an electronic mail ("email") address 322 for communication with the customer, (iii) a customer name 324, and (iv) a financial account identifier 326 that indicates a financial account the customer may use to pay for services.

Referring to FIG. 4, a table 400 represents an embodiment of the worker database 230 (FIG. 2). The table 400 includes entries 402, 404 and 406, each defining a worker that interacts with the controller 110 (FIG. 1) to process documents. It will be understood by those skilled in the art that the table 400 may include any number of entries. The table 400 also defines fields for each of the entries 402, 404 and 406. The fields specify (i) a worker identifier 420 that uniquely identifies the worker, (ii) an email address 422 for communication with the worker, (iii) a worker

name 424, (iv) a financial account identifier 426 that indicates a financial account that the worker may use to receive payment, (v) job skills 428 of the worker, (vi) a quality rating 430 of the worker, (vii) a speed rating 432 of the worker, and (viii) a fee charged 434 by the worker for its services. Those skilled in the art will understand that a number of other fields may specify further information regarding a worker, such as other types of ratings for the worker.

Referring to FIG. 5, a table 500 represents an embodiment of the document database 240 (FIG. 2). The table 500 includes entries 502 and 504, each defining a document that a customer needs to have processed by a worker. It will be understood by those skilled in the art that the table 500 may include any number of entries. The table 500 also defines fields for each of the entries 502 and 504. The fields specify (i) a document identifier 520 that uniquely identifies the document, (ii) the customer 522 for which the document is to be processed, (iii) a job code 524 that identifies the type of processing to be performed on the document, (iv) a price 526 to pay for processing the document, (v) how to receive payment 528 for processing performed, (vi) a required worker rating 530, (vii) a time 532 by which the document must be processed, (viii) other required characteristics 534 of the worker (if any), (ix) whether sections of the document must be processed by different workers 536, (x) section identifiers 538 that uniquely identify sections of the document that are to be processed by one or more workers, and (xi) whether and when the document processing has been completed 540.

Referring to FIG. 6, a table 600 represents an embodiment of the section database 250 (FIG. 2). The table 600 includes entries 602, 604, 606, 608 and 610, each defining a section that is to be processed by a worker. It will be understood

by those skilled in the art that the table 600 may include any number of entries. The table 600 also defines fields for each of the entries 602, 604, 606, 608 and 610. The fields specify (i) a section identifier 620 that uniquely identifies the section, (ii) a document identifier 622 of the document from which the section originated, (iii) a worker identifier 624 of the worker to which the section was sent, (iv) when the section was sent to the worker 626, (v) when the section was completed by the worker 628, and (vi) a price 630 the worker charges for processing the section.

Referring to FIG. 7, a method 700 for processing a document includes receiving a document from a customer (step 702). The step 702 may comprise receiving an electronic image, such as a JPEG ("Joint Photographic Experts Group") file or GIF ("Graphics Interchange Format"), of a paper document. Such an image may be generated by a device known as a "scanner" (e.g. a flatbed scanner or drum scanner) and sent via electronic mail to the controller 110 (FIG. 1). Other methods for generating the image and sending the image to the controller 110 will be understood by those skilled in the art.

Alternatively, the step 702 may comprise receiving a paper document and then generating an electronic document (e.g. one or more images) from the paper document. In such an embodiment, the controller 110 may include a scanner that generates an electronic document from the received paper document.

The document is divided into one or more sections (step 704). In one embodiment, each section comprises an image that is a portion of an image of the document. Thus, each section represents a portion of the document. As described in detail below, it can be advantageous to send only a section of a document to a worker. For example, one section of a document might include information that identifies a

person, while another section of the document might include confidential information about that person. Providing these two sections to two workers would thus keep the person anonymous to the worker processing the section including the confidential information.

The sections of the document are transmitted to one or more workers (step 706). A section may be transmitted to a worker in a number of ways, such as via email or via a web site. The workers receive the sections and perform corresponding data entry. The term "data entry" refers to the process of writing data into computer memory. Such computer memory may be volatile memory (e.g. RAM) or nonvolatile memory (e.g. disk subsystems or flash memory). As used herein, data entry includes (i) creating text from an image of a paper document by reading printing (e.g. printed characters) on the image and manually typing the text corresponding to the printing, (ii) proof reading and amending text, (iii) translating text (e.g. from one language to another), and (iv) creating text from an audio file by listening to the audio and manually typing the text corresponding to the audio. Those skilled in the art will understand that there are other types of data entry that the workers may perform after receiving a section of a document.

In one embodiment, it may be necessary to assure that a document is processed by at least two workers. However, in another embodiment it may be acceptable to send sections to one worker. For example, it may be sufficient to send the same sections to a worker if each section cannot be matched with the others. Such an embodiment is especially appropriate where a large number of documents are processed by a single worker. The worker could not match any one section with another from the same document. In addition, it can be desirable to delay the

transmission of the sections to the worker, since this reduces the ability of the worker to match the sections.

Once a worker has performed the specified data entry, the worker transmits back to the controller 110 (FIG. 1) a file that corresponds to the data entry. For example, the worker may transmit a text file that represents words that were printed in the section the worker received. The controller 110 receives files from each worker (step 708) and transmits the files to the customer (step 710). The controller 110 (FIG. 1) receives an amount of payment from the customer (step 712), and transmits appropriate amounts of payment to each worker (step 714). Alternatively, the controller 110 may initiate payment from the customer directly to each worker.

Referring to FIG. 8, a data flow diagram 800 illustrates the transfer of information among the devices of the apparatus 100 (FIG. 1). The illustrated transfer occurs during a first stage (i.e. steps 702, 704 and 706) of the method 700. The customer device 120 transmits an electronic document (e.g. an image of a paper document) to the controller 110, which in turn divides the electronic document into sections. The controller 110 then transmits the sections to the worker devices 130 and 135.

An image of a document may be divided into sections in a number of ways. Sections of the document may be defined by one or more predetermined indicia. The customer may include indicia in an image transmitted to the controller 110. For example, the document may be partially preprinted with the indicia, or the customer may add indicia to an electronic image of the document that it generates from a paper document. Alternatively, the indicia may be added after the customer provides the document. For example, the image may be marked with the indicia by

the controller 110. In one embodiment, documents may be marked with indicia in accordance with a predetermined process, and each customer may have one (or more) associated predetermined processes. For example, the controller 110 may add predetermined indicia to all documents received from a first predetermined customer. In such an embodiment, all documents received from the first predetermined customer would be divided into sections in accordance with the same process. This can be especially advantageous for businesses having a large number of documents of the same type (e.g. medical claim forms).

FIGS. 9A, 9B, 9C and 9D illustrate different ways to identify sections with indicia. In FIG. 9A, an image 900 includes indicia 902 that are in the form of a demarcation line. The indicia 902 thereby define two sections 904 and 906. In such an embodiment, it may be predetermined, for example, that the top section 904 contains information that identifies a person and the bottom section 906 contains confidential information about that person.

In FIG. 9B, an image 920 includes indicia 922, 924 and 926, each in the form of a boundary line that defines the perimeters of one of three sections 928, 930 and 932, respectively. Alternatively, more than one indicia can indicate a plurality of disjointed portions of the same section. For example, the indicia 922 and 926 may indicate two disjointed portions of the same section, while the indicia 924 can indicate another, different section. In such an embodiment, the indicia 922 and 926 may both be of the same type (to denote portions of the same section) while the indicia 924 are of a different type. For example, the indicia 922 and 926 may both be of an identical color, width or other style, which is different from that of the indicia 924.

In FIG. 9C, an image 940 includes indicia 942 and 944. The indicia 942 are in the form of a demarcation line that defines two sections 946 and 948. In such an embodiment, the indicia 944 may differentiate between the sections by identifying the section in which the indicia 944 is located. For example, the indicia 944 may indicate that the section 948 (which contains the indicia) contains information that identifies a person. In one embodiment, it would then be assumed that the remaining section 946 contains confidential information about that person.

In FIG. 9D, an image 960 includes indicia 962, 964 and 966. The indicia 962 are in the form of a demarcation line that defines two sections 968 and 970. The section 968 includes indicia 964 in the form of a bar code, and the section 970 includes indicia 966 that are also in the form of a bar code. In such an embodiment, the indicia 964 and 966 may identify the sections 968 and 970 respectively. For example, the indicia 964 may indicate that the corresponding section (the section 968) contains information that identifies a person, while indicia 966 may indicate that the corresponding section (the section 970) contains confidential information about that person.

Referring to FIG. 10, an image 1000 of a document includes indicia 1002 and 1004, each in the form of a boundary line that defines the perimeters of two sections 1012 and 1014, respectively. The section 1012 contains information that identifies a person (i.e. a name, social security number and address). The section 1014 contains confidential information about that person (i.e. medical information).

Sections of the document may alternatively be identified as predetermined locations within a document. For example, the top half of a document may be a first section and the bottom half may be a second section. In one

embodiment, documents may be divided into sections in accordance with a predetermined set of locations, and each customer may have one (or more) associated predetermined sets of locations. For example, all documents received from a first customer may be divided into three identically sized sections: a bottom section, a middle section and a top section.

Sections may be mutually exclusive so that no section overlaps another section. Conversely, sections may overlap so that a portion of a document is included in more than one section. Furthermore, a document may include one or more sections, but there may be portions of a document that are not included in any section. Such portions are thus not provided to workers. For example, a portion of a document that includes a standard letterhead logo may need no processing. In addition, as described above a section may include two disjointed portions of a document.

Different sections of a document may include different types of information. For example, a first section may include confidential information about a person, while a second section includes information that identifies that person. Sections may also contain the same type of information, yet each section would include a small portion of such information. This is advantageous where there exists a large amount of one type of information, and it would be easier to break up the information into more manageable sizes.

The image 1000 also includes an identifier 1020 that is in the form of a set of characters. Although in FIG. 10 the identifier 1020 is in the form of a set of characters, in other embodiments the identifier may be in another form, such as a bar code. The identifier 1020 identifies processing criteria (the customer's requirements and/or preferences for processing the document). The identifier may indicate, for

example, an amount of payment to be paid for processing the document, billing information, a job code that specifies the type of processing required, a required rating of the worker(s), an indication of whether sections of the document can go to a single worker, a time when completion by the worker is required, and required characteristics of the worker.

The identifier 1020 on the image 1000 may indicate the document identifier described above with reference to FIG. 5. In such an embodiment, the document identifier may be used to access further information from the document database 240 (FIG. 2) from which processing criteria may be derived. In another embodiment, the identifier may represent the processing criteria. For example, if the identifier is a set of characters, the first two characters may indicate billing information, the second three characters may indicate the type of processing required and the final eight characters may indicate a time when completion by the worker is required. Similarly, if the identifier is a bar code that represents a sequence of digits, the various digits may represent various types of processing criteria, as would be apparent to one skilled in the art.

FIGS. 11A and 11B each illustrate a section of a document that may be sent to a worker. The section 1100 (FIG. 11A) corresponds to the section 1012 of FIG. 10, and the section 1150 (FIG. 11B) corresponds to the section 1014 of FIG. 10. The section 1100 includes a bar code 1102 that indicates worker criteria for the section 1100. Similarly, the section 1150 includes a bar code 1152 that indicates worker criteria for the section 1150. As described below, the worker criteria of a section specify requirements and/or preferences for processing the document that are provided to the worker. For example, the worker criteria may indicate a time of

completion for the worker. In one embodiment, the worker criteria are based, at least in part, on the processing criteria received from the customer. In one embodiment, the worker criteria may simply indicate the section's corresponding document or customer.

FIG. 12 illustrates a method 1200 for processing a document in accordance with an embodiment of the present invention. The method 1200 generally describes an embodiment of the steps 702, 704 and 706 of the method 700 (FIG. 7).

A paper document is received from a customer (step 1202) and a corresponding electronic document (e.g. an image of the paper document) is generated (step 1204). In an alternate embodiment, an electronic document is received (e.g. via email). Processing criteria associated with the image are also received (step 1206). As described above, the processing criteria indicate the customer's requirements and/or preferences for processing the document. The processing criteria may comprise a job code that identifies the type of data entry to be performed on the document. Similarly, the processing criteria may comprise a requirement that a section is processed by two or more workers, so that one worker can "proofread" the work of another, or so that inaccurate processing performed by any one or more workers may be more readily detected.

The processing criteria may be machine-readable (e.g. in the form of a bar code) to automate reading and interpreting the processing criteria. Alternatively, the processing criteria may be text or other indicia that is not interpreted by the controller 110, but that is read by human personnel who direct the operations of the controller 110 accordingly. In another embodiment, the processing criteria may be text or other indicia that is merely made available to be read by workers.

The processing criteria may be received separately from the document, or may be incorporated into the image of the document (e.g. as a bar code or other indicia on the document). The processing criteria may be received substantially simultaneously with the paper document. Typically, separate processing criteria would accompany each paper document. In an alternate embodiment, processing criteria may be received from a customer, and the processing criteria are then applied to all documents received from that customer. In such an embodiment, the customer may, for example, desire that only one type of data entry ever be performed.

The controller 110 then determines a first section of the image that is indicated by first predetermined indicia (step 1208), and determines a second section of the image that is indicated by second predetermined indicia (step 1210). In one embodiment, the first predetermined indicia may be the second predetermined indicia. For example, referring again to FIG. 9A, the indicia 902 are in the form of a demarcation line that defines two sections 904 and 906. Thus, the same indicia 902 indicate both sections 904 and 906.

Based on the processing criteria, the controller 110 selects a first worker and a second worker (steps 1212 and 1214). In one embodiment, a worker is selected if the type of work that the worker performs corresponds to the job code included in the processing criteria. For example, if the job code identifies that a document must be translated from German to English, then a worker having the requisite job skills (i.e. German language translation) is selected. Various methods for selecting workers are described below.

After the first worker and the second worker are selected, the first section is transmitted to the first worker (step 1216) and the second section is

transmitted to the second worker (step 1218). In addition, a first identifier that identifies the document is transmitted to the first worker (step 1220), and a second identifier that also identifies the document is transmitted to the second worker (step 1222). The first identifier and the second identifier may be identical but need not be. For example, the first identifier may be "D1" and the second identifier may be "E1", yet each may refer to the same document (e.g. the last character may uniquely identify the document). In another embodiment, the first identifier and the second identifier may identify a customer instead of the document. Thus, the sections would still correspond to a customer, and each corresponding file received in response to a transmitted section would correspond to a customer.

The worker criteria may include the above-described identifiers. Furthermore, the worker criteria may be transmitted and received in a manner similar to that described herein with regard to the processing criteria. For example, the first identifier and the second identifier may be transmitted separately, or may be incorporated into the sections themselves. For example, the identifiers may comprise a bar code, and the controller 110 could label each section with an identifier in the form of a bar code. Sections and identifiers may be transmitted in several ways, such as via email or via a site on the World Wide Web.

Those skilled in the art will understand that the above-described step of transmitting a first section to a first worker and a second section to a second worker may comprise transmitting the first section to a worker in a first group of workers and the second section to a worker in a second group of workers. In such an embodiment, it may be desirable that the first group of workers are qualified to receive a first type of section (e.g. a section that includes information that identifies a person) and that the

second group of workers are qualified to receive a second type of section (e.g. a section that includes confidential information about that person). Accordingly, it may be necessary to ensure the workers in that one group (or both groups) satisfy minimum requirements (e.g. no criminal background).

Referring to FIG. 13, a data flow diagram 1300 illustrates the transfer of information among the devices of the apparatus 100 (FIG. 1). The illustrated transfer occurs during a second stage (i.e. steps 708 and 710) of the method 700, which is after that illustrated by FIG. 8. The worker devices 130 and 135 each transmit a file to the controller 110. The controller 110 then transmits the files to the customer device 120. The files may be transmitted to the customer device 120 separately, or the controller 110 may combine the files and transmit the combined file to the customer device 120.

Referring to FIG. 14, a method 1400 for processing a document includes receiving a first file from a first worker (step 1402). The first file corresponds to data entry performed on a first section that was previously transmitted to the first worker. As described above, the first section is derived from a document and may be a portion of the document. For example, the first file may be a text file of manually typed text. In another embodiment described in more detail below, the first file may be data that is created by the worker via a form and stored according to various fields of the form.

The controller 110 may also receive a first identifier that identifies a first document (from which the first section was derived). For example, the first identifier may be a document identifier as illustrated in field 520 (FIG. 5). The first

identifier may also be a section identifier as illustrated in the field 620 (FIG. 6), which would, in turn, indicate a document, as is apparent from the field 622 (FIG. 6).

The first identifier may be received substantially simultaneously with the first file. For example, the first identifier may be received immediately before or immediately after the first file is received, thereby associating the first file with the first identifier. The first file may also include the first identifier, thereby allowing the document to be identified from the file. Other methods for identifying the first document from which the first section was derived will be understood by those skilled in the art.

A second file is received from a second worker (step 1404). The second file corresponds to data entry performed on a second section that was previously transmitted to the second worker. A second identifier also identifies a second document from which the second section was derived. The second file and the step of receiving the second file are analogous to the description above of the step 1402.

The controller 110 determines whether the first document and the second document are equivalent (step 1406). If so, then the first section and the second section are derived from the same document, and accordingly the first file and the second file represent data entry performed in connection with the same document. Consequently, in one embodiment both the first file and the second file are destined for the same customer. The customer that is associated with both the first file and the second file is determined (step 1408). For example, referring again to FIG. 5, each document corresponds to a customer, as indicated by fields 520 and 522 of the document database 240. Thus, the customer may be determined from the document

database 240. The first file and the second file are transmitted to the customer (step 1410). As described above, the files may be transmitted to the customer device 120 separately, or the controller 110 may combine the files and transmit the combined file to the customer device 120.

The workers are rated based on their work (step 1412). For example, the first worker is rated based on the first file and possibly based on a previous rating, if any. Rating a worker is described in the parent application, U.S. Patent Application No. 09/112,131, entitled "METHOD AND APPARATUS FOR A CRYPTOGRAPHICALLY-ASSISTED COMMERCIAL NETWORK SYSTEM DESIGNED TO FACILITATE AND SUPPORT EXPERT-BASED COMMERCE", filed on July 8, 1998.

Although two sections and two corresponding files were described with reference to FIG. 14, a document may include one or more sections that are processed. Accordingly, in one embodiment, it may be desirable to determine the number of sections in a document, and all corresponding files are transmitted only after a predetermined number of files (e.g. the number of sections) have been received. Alternatively, each file may be transmitted to the customer when it is received.

Referring to FIG. 15, a form 1500 illustrates a form that may be used to allow a worker to enter data based on the section 1100 (FIG. 11) and to store that data according to fields of the form 1500. The form 1500 includes a form field 1502 that permits entry of a name, a form field 1504 that permits entry of a social security number and a form field 1506. Forms may be sent along with a corresponding document from the customer to the controller 110 (FIG. 1) and in turn to the worker.

Forms may also be provided to a worker via a web site. For example, a worker may be provided with a "URL" (Uniform Resource Locator) that identifies a web site or other computer-based communication channel. Upon accessing the URL, the form may be presented to the worker. Those skilled in the art will understand that various types of forms may be readily displayed. For example, HTML forms are well known to those skilled in the art, as are proprietary form formats such as PDF (portable document format) sold by Adobe and JetForm.

In one embodiment, the form may be accessible through a web site after the worker enters an access code at the web site. The access code may serve as authorization that the worker is allowed to access a form. The access code may additionally or alternatively uniquely identify one of a plurality of forms that are available via the web site. The access code may be provided to the worker in the worker criteria discussed above. The access code may be provided to the worker by other means as well, such as transmitted along with the section.

Data that is entered via a form may be transmitted to the controller 110 which in turn transmits the data to the customer device 120. Alternatively, the data entered via the form may be transmitted directly to the customer device 120 and/or a database specified by the customer.

Referring to FIG. 16, a table 1600 represents a form database. The form database may be a part of the section database 250 (FIG. 2). The table 1600 includes entries 1602, 1604, 1606, 1608 and 1610, each defining a form to enter data in connection with processing a section. It will be understood by those skilled in the art that the table 1600 may include any number of entries. The table 1600 also defines fields for each of the entries 1602, 1604, 1606, 1608 and 1610. The fields

specify (i) a section identifier 1620 that uniquely identifies the section, (ii) a form identifier 1622 that uniquely identifies the form, (iii) a URL 1624 that identifies a web site where the form may be accessed, and (iv) an access code 1626 that is required to access the web site and/or specify a particular form available at the web site.

One URL may be specified for more than one form. For example, the entries 1606, 1608 and 1610 all have the same URL "www.z.com". However, at least three forms "F3", "F4" and "F5" are all accessible using that URL. In particular, different access codes distinguish among the different forms.

As described above, payment may be rendered either directly or indirectly from customer to worker. Payment usually comprises a crediting of an account, such as a bank account or credit card account. However, payment may also be rendered via check or other means. The customer may be billed after any predetermined event, such as when the worker transmits the appropriate files to the customer. In one embodiment, the customer may be billed periodically (e.g. every month) for all fees due to workers.

Payment due may be defined by the customer, such as when the customer sets forth an amount to be paid for a particular document. Payment may also be defined by the worker, such as when the worker charges a time-based or job-based fee. Alternatively, a plurality of workers may participate in a "Dutch" auction and compete for the lowest amount or rate of pay they will accept in exchange for a particular section or type of work. The lowest bidder would then earn the right to perform the specified work in exchange for the highest bid amount. Similarly, a plurality of workers may participate in a "reverse" auction in which bidding starts low and increases until all sections have been accepted by workers. Other types of

auctions may take place among workers to specify pay rates and terms. In addition, just as workers may compete in an auction for sellers, sellers may compete in an auction for workers.

A section of a document may include significant amounts of information, and processing such a section may require a significant amount of time. Consequently, it can be advantageous to allow a plurality of workers to participate in processing a single section. Similarly, it can be advantageous to allow a worker to receive a payment upon processing a portion of a section. Accordingly, the present invention permits a section to be partially processed by a first worker, and a second worker can further process the section. For example, a first worker may create a first text file representing the first page of a document, and a second worker may create a second text file representing the remaining pages of the document.

FIG. 17 illustrates a method 1700 for permitting a section to be processed by a plurality of workers. A section is transmitted to a worker (step 1702), as discussed above. In response, a file is received from the worker (step 1704), as also discussed above. The controller 110 then determines whether the section has been completely processed (step 1706). In other words, the controller 110 determines whether there is a portion of the section on which processing was not performed.

If there is a portion of the section on which processing was not performed, then at least that portion (possibly the entire section) is transmitted to another worker (step 1708). The file from the original worker may also be sent to the subsequent worker to allow that worker to more readily determine which portions of the section have been processed. Subsequently, a file is received from the subsequent

worker (step 1710). The steps 1706, 1708 and 1710 are repeated until the section has been completely processed by one or more workers.

All received files may be combined to form a combined file (step 1712). The combined file is in turn transmitted to the customer (step 1714). Alternatively, the files may be transmitted to the customer upon receipt. In an embodiment where the combined file is created, the customer need not know that the section has been processed by a plurality of workers.

In order to determine whether the section has been completely processed, a "stop indicator" may be received with, or included in, the file. A stop indicator indicates where in the section the worker stopped processing the section, and therefor indicates the portion of the section that has not been processed. The stop indicator may be a textual description of the portion of the section on which processing was not performed. For example, the stop indicator may comprise the text "Until page 3, second paragraph".

In another embodiment, a file received from a worker may include the portion of the section that has not been processed. Alternatively, a file received from a worker may include the section which the worker has marked with indicia that indicates a portion of the section on which processing was not performed. Such indicia may be considered a "stop indicator" that indicates were the worker stopped processing the section. For example, the stop indicator may comprise a boundary line that separates a portion that was processed from a portion that was not processed.

Referring to FIG. 18, a table 1800 represents a record of another embodiment of the section database 250 (FIG. 2). In the illustrated embodiment, each section may be processed by one or more workers, and accordingly the processing

performed by each worker is recorded. Accordingly, each record corresponds to a section as indicated by the section identifier 1802. The record also includes a document identifier 1804 to identify the document from which the section originated. The record further includes entries 1806, 1808 and 1810, each of which defines a portion of the section that was processed by a worker. The table 1800 also defines fields for each of the entries 1806, 1808 and 1810. The fields specify (i) a worker identifier 1820 of the worker to which the portion was sent, (ii) when the portion was sent to the worker 1822, (iii) when the portion was completed by the worker 1824, (iv) a price 1826 the worker charges for processing the portion, and (v) a percentage completion 1828 of the section after the specified worker completes processing his respective portion.

It can be advantageous to allow a customer to specify processing criteria for a group of documents, rather than processing criteria for each document. A customer may only be concerned with a "high level" goal, and thus want to specify high level processing criteria for the group of documents. For example, a customer may wish to specify that a group of one thousand documents is processed within a week for an average cost of under $10 per document. Accordingly, in one embodiment of the present invention a customer may specify processing criteria that apply to a plurality of documents. The controller 110 (FIG. 1) then apportions the documents among workers in a manner that satisfies the processing criteria.

FIG. 19 illustrates a method 1900 for processing a plurality of documents in accordance with processing criteria for the plurality. The controller 110 receives a plurality of documents from the customer (step 1902), and also receives processing criteria applicable to the plurality of documents (step 1904). The

documents and processing criteria may be received in a manner similar to that described above. The processing criteria may specify, for example, a number of the plurality of documents to process in a predetermined time period (e.g. at least five of these documents must be processed within a week), a required accuracy of processing (e.g. the documents must be at least 99% accurately transcribed), and a desired cost for processing the plurality of documents (no more than $1000 to process the plurality).

A plurality of workers are selected based on the processing criteria (step 1906). For example, the controller 110 may select ten workers that are qualified for the task and that also have the lowest rates. Similarly, the controller 110 may select twenty of the fastest workers if there is not much time. In one embodiment, work may be apportioned among a first set of workers that perform typing, and a second set of workers that proofread the files generated by the first set of workers. In such an embodiment, the controller 110 may determine whether it is more economical to hire more of the first set than of the second set to achieve the same overall level of accuracy.

The workers may also be selected based on the work loads of the workers. For example, if a particular worker has been assigned a large number of sections and has not processed many of those sections, the controller 110 may determine that the worker has a large work load and thus is unlikely to provide rapid service. Conversely, if a particular worker has few or no unprocessed sections, the controller 110 may determine that the worker has a small work load and thus is likely to provide rapid service. In addition, the past response rate (duration from receiving a

section and completing processing for the section) of a worker may be considered in determining his future response rate.

The documents and/or sections of the documents are apportioned among the plurality of workers (step 1908) so each worker is assigned a section of a document and all sections are allocated. The sections are transmitted to the appropriate worker (step 1910). Transmitting sections to workers and subsequently receiving files from those workers has been described above.

Although the present invention has been described with respect to a preferred embodiment thereof, those skilled in the art will note that various substitutions may be made to those embodiments described herein without departing from the spirit and scope of the present invention.

What is claimed is:

1. A method for processing a document, comprising:

determining a first section of a document;

determining a second section of the document;

transmitting the first section of the document to a first worker to perform corresponding data entry;

transmitting to the first worker a first identifier that identifies the document;

transmitting the second section of the document to a second worker to perform corresponding data entry; and

transmitting to the second worker a second identifier that identifies the document.

2. The method of claim 1, further comprising:

providing the first worker with access to a first database to enter data corresponding to the first section.

3. The method of claim 1, in which the document comprises an image.

4. The method of claim 3, further comprising:

generating the image by scanning a paper document.

5. The method of claim 3, further comprising:

marking the image with at least one of the first predetermined indicia and the second predetermined indicia.

6. The method of claim 3, in which the first section comprises a portion of the image.

7. The method of claim 1, in which the first predetermined indicia is the second predetermined indicia.

8. The method of claim 1, in which the first predetermined indicia comprises:

an indication of a boundary between the first section of the document and the second section of the document.

9. The method of claim 8, in which the first predetermined indicia comprises:

an indication of one of the first section of the document and the second section of the document.

10. The method of claim 1, in which the first predetermined indicia comprises a bar code.

11. The method of claim 1, further comprising:

labeling the first section with an identifier that indicates a customer.

12. The method of claim 11, in which the identifier that indicates a customer comprises:

a bar code.

13. The method of claim 1, further comprising:

receiving processing criteria.

14. The method of claim 13, in which the processing criteria indicates at least one of:

an amount of payment to be paid,

billing information,

a job code,

a required rating of the first worker,

an indication of whether sections of the document can go to a single worker,

a time of completion by the first worker, and

a required characteristic of the first worker.

15. The method of claim 13, in which the document includes a bar code that indicates the processing criteria.

16. The method of claim 13, in which the document includes a set of characters that indicate the processing criteria.

17. The method of claim 1, further comprising:

transmitting worker criteria to the first worker.

18. The method of claim 17, in which the worker criteria indicates at least one of:

a customer identifier,

an amount of payment to be paid,

a job code,

billing information, and

a time of completion by the first worker.

19. The method of claim 17, in which the first section is labeled with a bar code that indicates the worker criteria.

20. The method of claim 17, further comprising:

creating the worker criteria from received processing criteria.

21. The method of claim 17, in which the first section includes a set of characters that indicate the worker criteria.

22. The method of claim 1, further comprising:

ascertaining a size of the first section.

23. The method of claim 22, further comprising:

if the size of the first section is greater than a predetermined threshold, creating a third section and a fourth section from the first section, the third section and the fourth section each having a size less than the size of the first section.

24. The method of claim 23, further comprising:

transmitting the third section of the document to a third worker to perform corresponding data entry; and

transmitting the fourth section of the document to a fourth worker to perform corresponding data entry.

25. The method of claim 1, further comprising:

providing the first worker with access to a form that permits entry of data for the first section.

26. The method of claim 25, in which the form comprises an HTML form.

27. The method of claim 1, further comprising:

receiving an offer price to be paid in exchange for performance of corresponding data entry.

28. The method of claim 27, further comprising:

receiving a payment identifier that specifies a financial account to pay the offer price.

29. The method of claim 1, in which the step of determining a first section of a document comprises:

determining a first section of a document, the first section being indicated by first predetermined indicia.

30. An apparatus for processing a document, comprising:

a processor; and

a storage device in communication with the processor, the storage device storing a program for directing the processor to:

determine a first section of a document, and

determine a second section of the document; and

transmit the first section of the document to a first worker to perform corresponding data entry;

transmit to the first worker a first identifier that identifies the document;

transmit the second section of the document to a second worker to perform corresponding data entry; and

transmit to the second worker a second identifier that identifies the document.

31. A method for processing a document, comprising:

receiving a job code associated with an electronic document;

determining a first section of the electronic document that is indicated by first predetermined indicia;

determining a second section of the electronic document that is indicated by second predetermined indicia;

selecting, based on the job code, a first worker from a plurality of workers;

transmitting the first section of the electronic document to the first worker to perform corresponding data entry;

transmitting to the first worker a first identifier that identifies the electronic document;

selecting, based on the job code, a second worker from the plurality of workers;

transmitting the second section of the electronic document to the second worker to perform corresponding data entry, the second worker being different from the first worker; and

transmitting to the second worker a second identifier that identifies the electronic document.

32. The method of claim 31, in which the job code specifies a type of work to be performed on the electronic document.

33. The method of claim 32, in which the step of selecting a first worker comprises:

selecting a first worker if a type of work that the first worker performs corresponds to the job code.

34. The method of claim 31, in which the step of selecting a first worker comprises:

determining a bid price each of plurality of workers is willing to accept; and

selecting a worker having a lowest bid price.

35. The method of claim 31, further comprising:

generating the electronic document from a paper document.

36. A method for processing a document, comprising:

receiving a first file from a first worker, the first file corresponding to data entry performed on a first previously-transmitted section of a document;

receiving a second file from a second worker, the second file corresponding to data entry performed on a second previously-transmitted section of the document;

determining a customer associated with both the first file and the second file; and

transmitting the first file and the second file to the customer.

37. The method of claim 36, further comprising:

rating the first worker based on the first file.

38. The method of claim 37, in which the step of rating comprises:

rating the first worker based on the first file and a previous rating of the first worker.

39. The method of claim 36, in which the step of transmitting the first file and the second file to the customer comprises:

creating a combined file that includes the first file and the second file; and

transmitting the combined file to the customer.

40. The method of claim 36, in which the step of transmitting the first file and the second file to the customer is performed after a predetermined number of files have been received.

41. The method of claim 36, further comprising:

paying the first worker.

42. An apparatus for processing a document, comprising:

a processor; and

a storage device in communication with the processor, the storage device storing a program for directing the processor to:

receive a first file from a first worker, the first file corresponding to data entry performed on a first previously-transmitted section of a document;

receive a second file from a second worker, the second file corresponding to data entry performed on a second previously-transmitted section of the document;

determine a customer associated with both the first file and the second file; and

transmit the first file and the second file to the customer.

43. A method for processing a document, comprising:

receiving a first file from a first worker, the first file corresponding to data entry performed on a first previously-transmitted section of a first document, the first file indicating a first identifier that identifies the first document;

receiving a second file from a second worker, the second file corresponding to data entry performed on a second previously-transmitted section of a second document, the second file indicating a second identifier that identifies the second document;

determining whether the first document and the second document are equivalent;

determining a customer associated with both the first file and the second file; and

transmitting the first file and the second file to the customer.

44. A method for processing a document, comprising:

determining a section of a document, the section being indicated by predetermined indicia;

transmitting the section of the document to a worker to perform corresponding data entry;

receiving a file from the worker, the file corresponding to data entry performed on the section of the document;

determining a customer associated with the file; and

transmitting the file to the customer.

45. The method of claim 44, in which the step of transmitting the section of the document to a worker comprises:

transmitting the section of the document to a first worker and to a second worker;

and in which the step of receiving a file from the worker comprises:

receiving a first file from the first worker; and

receiving a second file from the second worker.

46. The method of claim 45, further comprising:

comparing the first file and the second file.

47. The method of claim 44, further comprising:

transmitting the file to an additional worker; and

receiving from the additional worker an indication of a quality of the file.

48. The method of claim 44, further comprising:

receiving the document from the customer.

49. The method of claim 48, in which the document comprises an image.

50. An apparatus for processing a document, comprising:

a processor; and

a storage device in communication with the processor, the storage device storing a program for directing the processor to:

determine a section of a document, the section being indicated by predetermined indicia;

transmit the section of the document to a worker to perform corresponding data entry;

receive a file from the worker, the file corresponding to data entry performed on the section of the document;

determine a customer associated with the file; and

transmit the file to the customer.

51. A method for processing a document, comprising:

determining a first section of a document that is indicated by first predetermined indicia;

determining a second section of the document that is indicated by second predetermined indicia;

transmitting the first section of the document to a first worker to perform corresponding data entry;

transmitting to the first worker a first identifier that identifies the document;

transmitting the second section of the document to a second worker to perform corresponding data entry;

transmitting to the second worker a second identifier that identifies the document;

receiving a first file from the first worker, the first file corresponding to data entry performed on the first section of the document; and

receiving a second file from the second worker, the second file corresponding to data entry performed on the second section of the document.

52. A method for processing a document, comprising:

generating an electronic document from a paper document;

receiving a job code associated with the electronic document;

determining a first section of the electronic document that is indicated by first predetermined indicia;

determining a second section of the electronic document that is indicated by second predetermined indicia;

selecting, based on the job code, a first worker from a plurality of workers;

transmitting the first section of the electronic document to the first worker to perform corresponding data entry;

transmitting to the first worker a first identifier that identifies the electronic document;

selecting, based on the job code, a second worker from the plurality of workers;

transmitting the second section of the electronic document to the second worker to perform corresponding data entry, the second worker being different from the first worker;

transmitting to the second worker a second identifier that identifies the electronic document;

receiving a first file from the first worker, the first file indicating a third identifier;

receiving a second file from the second worker, the second file indicating a fourth identifier;

comparing the third identifier and the fourth identifier to determine whether both the third identifier and the fourth identifier identify the electronic document;

determining a customer associated with both the first file and the second file; and

transmitting the first file and the second file to the customer.

53. A method for processing a document, comprising:

receiving a plurality of documents;

receiving processing criteria for processing the plurality of documents;

selecting a plurality of workers in accordance with the processing criteria; and

apportioning the plurality of documents among the plurality of workers in accordance with the processing criteria.

54. The method of claim 53, in which the criteria for processing includes at least one of:

a number of the plurality of documents to process in a predetermined time period,

a required accuracy of processing, and

a desired cost.

55. The method of claim 53, in which the step of selecting a plurality of worker comprises:

selecting a plurality of workers in accordance with the processing criteria and in accordance with at least one of work loads and response rates of the plurality of workers.

56. The method of claim 53, further comprising:

transmitting the sections to the plurality of workers to perform corresponding data entry.

57. An apparatus for processing a document, comprising:

a processor; and

a storage device in communication with the processor, the storage device storing a program for directing the processor to:

receive a plurality of documents;

receive processing criteria for processing the plurality of documents;

select a plurality of workers in accordance with the processing criteria; and

apportion the plurality of documents among the plurality of workers in accordance with the processing criteria.

58. A method for processing a document, comprising:

receiving a plurality of documents;

receiving processing criteria for processing the plurality of documents;

selecting a plurality of workers in accordance with the processing criteria;

determining for each document a section that is indicated by predetermined indicia; and

apportioning the plurality of documents among the plurality of workers in accordance with the processing criteria; and

transmitting the sections to the plurality of workers to perform corresponding data entry.

59. A method for processing a document, comprising:

determining a section of the document that is indicated by first predetermined indicia;

transmitting the section of the document to a first worker to perform corresponding data entry;

receiving a file from the first worker, the file corresponding to data entry performed on the section of the document,

determining a first portion of the section on which processing was not performed; and

transmitting the first portion of the section to a second worker to perform corresponding data entry.

60. The method of claim 59, in which the file comprises the section of the document.

61. The method of claim 59, in which the step of determining a first portion of the section on which processing was not performed comprises:

receiving a stop indicator that indicates a first portion of the section on which processing was not performed.

62. The method of claim 61, in which the file includes the stop indicator.

63. The method of claim 62, in which the file includes second predetermined indicia indicating the first portion of the section on which processing was not performed.

64. The method of claim 61, in which the stop indicator comprises a textual description of a first portion of the section on which processing was not performed.

65. An apparatus for processing a document, comprising:

a processor; and

a storage device in communication with the processor, the storage device storing a program for directing the processor to:

determine a section of the document that is indicated by first predetermined indicia;

transmit the section of the document to a first worker to perform corresponding data entry;

receive a file from the first worker, the file corresponding to data entry performed on the section of the document,

determine a first portion of the section on which processing was not performed; and

transmit the first portion of the section to a second worker to perform corresponding data entry.

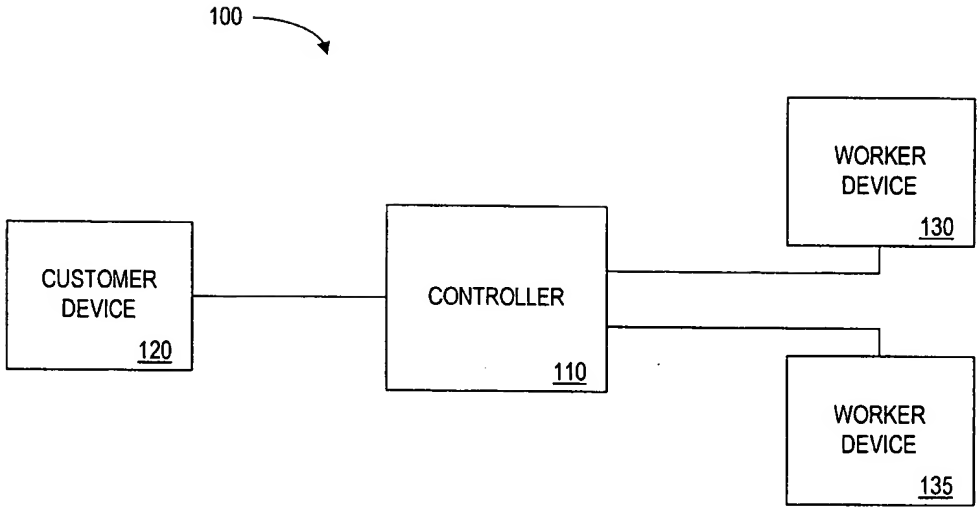

100
WORKER DEVICE
130
CUSTOMER DEVICE
120
CONTROLLER
110
WORKER DEVICE
135

FIG. 1

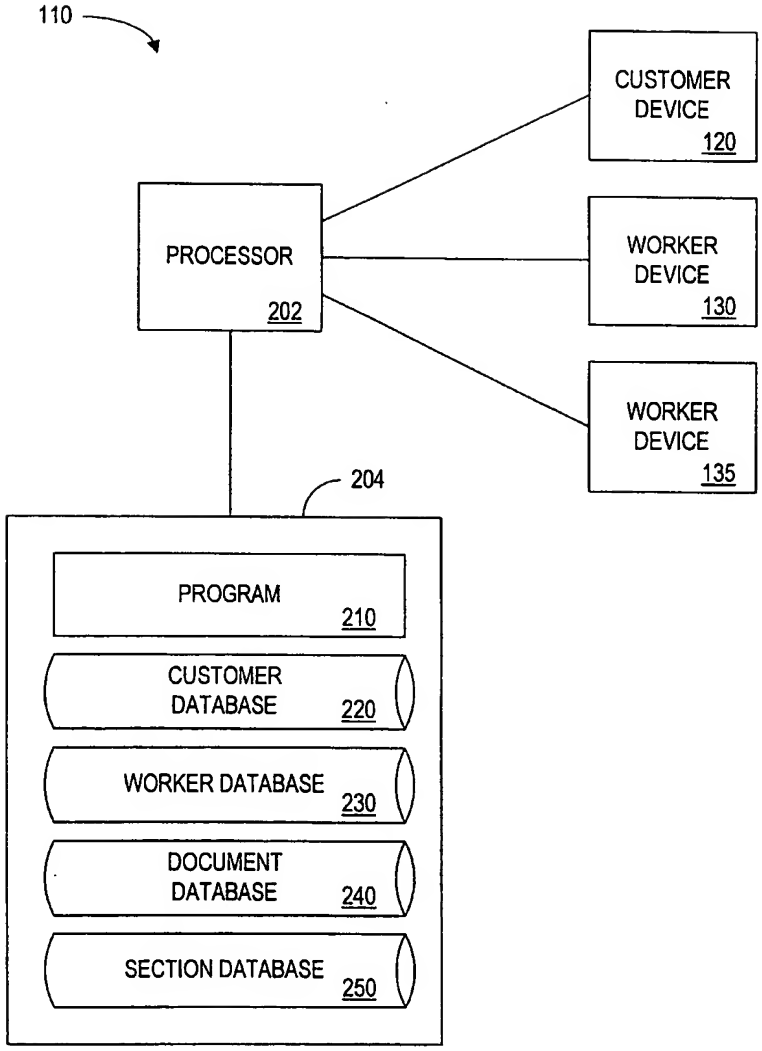

110
CUSTOMER DEVICE 120
PROCESSOR 202
WORKER DEVICE 130
WORKER DEVICE 135
204
PROGRAM 210
CUSTOMER DATABASE 220
WORKER DATABASE 230
DOCUMENT DATABASE 240
SECTION DATABASE 250

FIG. 2

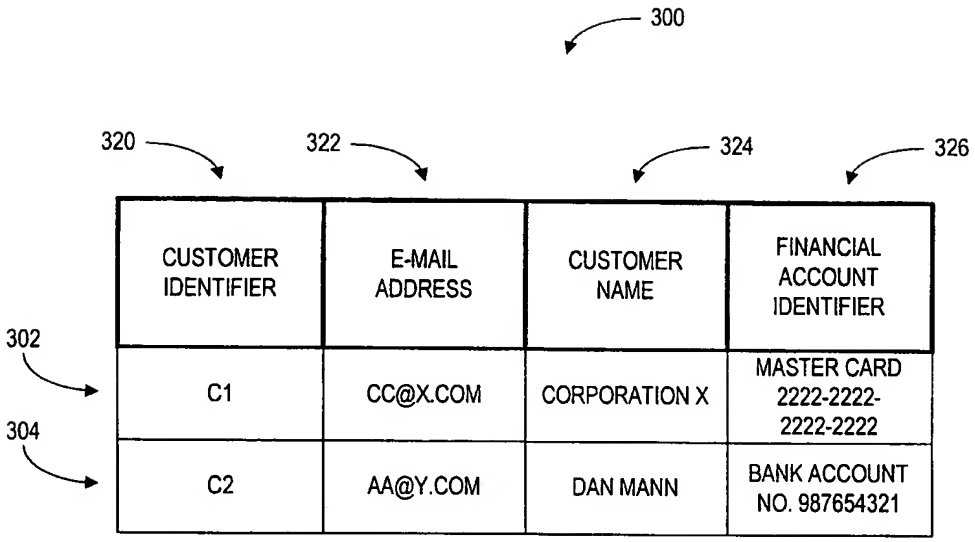

300
320
322
324
326
302
304
CUSTOMER IDENTIFIER
E-MAIL ADDRESS
CUSTOMER NAME
FINANCIAL ACCOUNT IDENTIFIER
C1
CC@X.COM
CORPORATION X
MASTER CARD 2222-2222-2222-2222
C2
AA@Y.COM
DAN MANN
BANK ACCOUNT NO. 987654321

FIG. 3

4 / 21

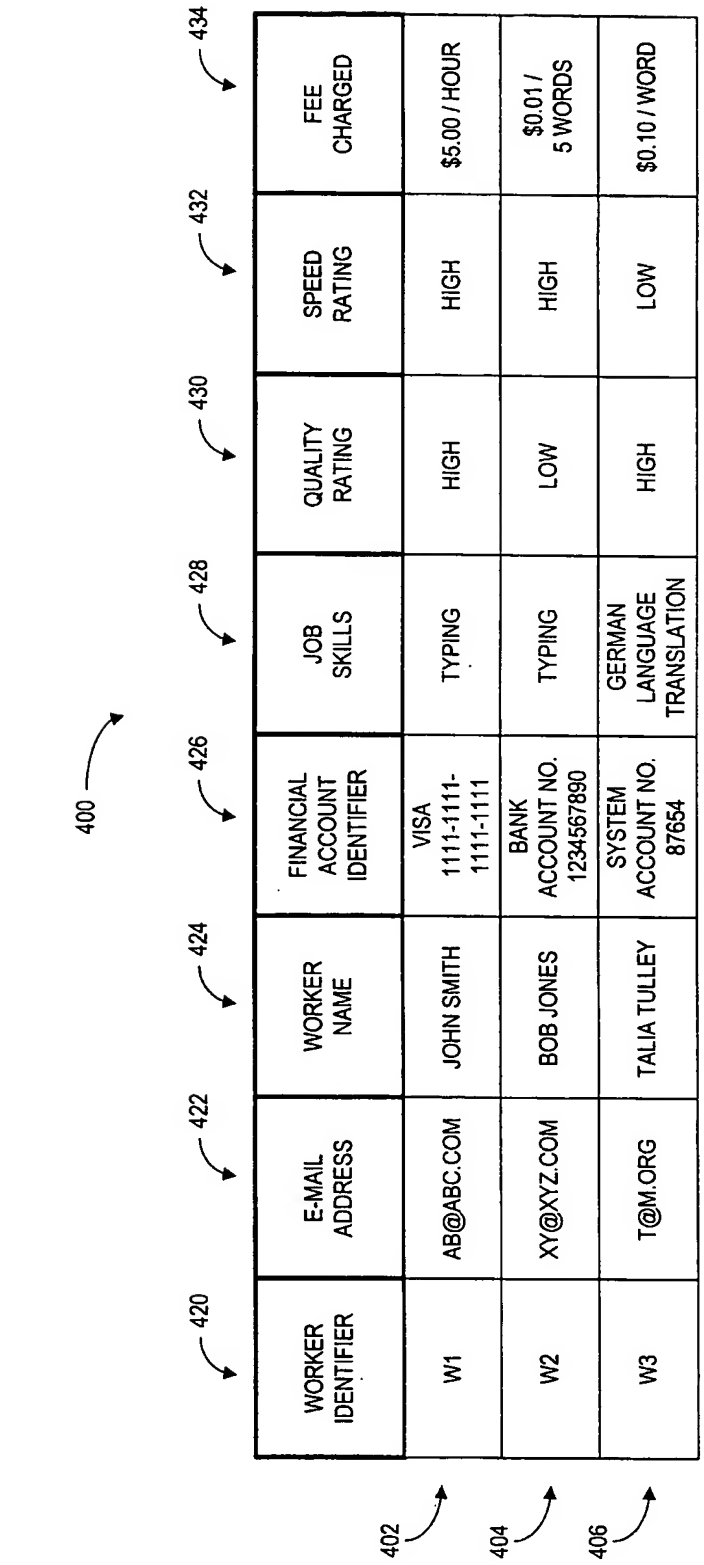

400
420
422
424
426
428
430
432
434
WORKER IDENTIFIER
E-MAIL ADDRESS
WORKER NAME
FINANCIAL ACCOUNT IDENTIFIER
JOB SKILLS
QUALITY RATING
SPEED RATING
FEE CHARGED
W1
AB@ABC.COM
JOHN SMITH
VISA 1111-1111-1111-1111
TYPING
HIGH
HIGH
$5.00 / HOUR
W2
XY@XYZ.COM
BOB JONES
BANK ACCOUNT NO. 1234567890
TYPING
LOW
HIGH
$0.01 / 5 WORDS
W3
T@M.ORG
TALIA TULLEY
SYSTEM ACCOUNT NO. 87654
GERMAN LANGUAGE TRANSLATION
HIGH
LOW
$0.10 / WORD
402
404
406

FIG. 4

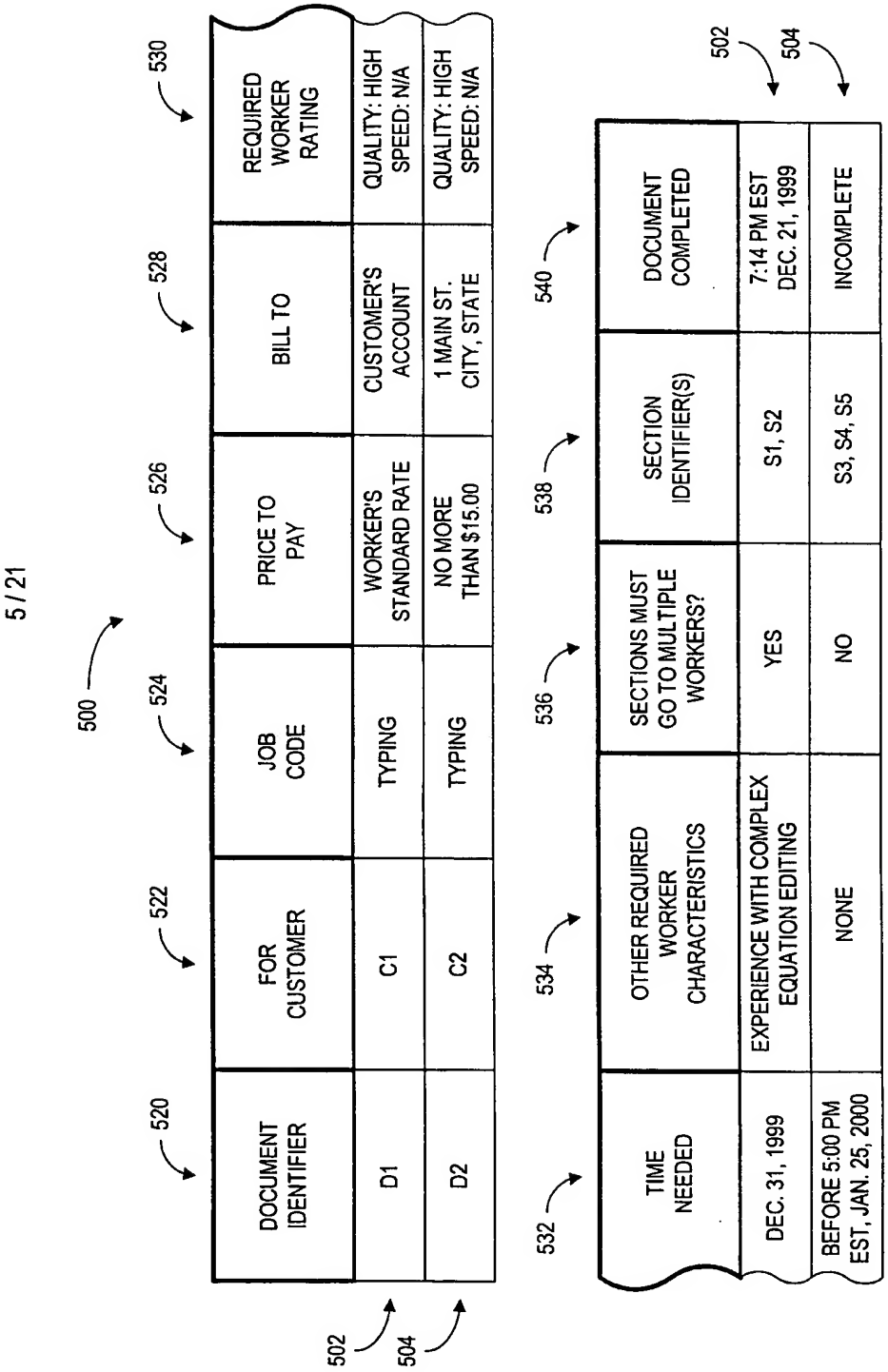

5/21
500
520
522
524
526
528
530
DOCUMENT IDENTIFIER
FOR CUSTOMER
JOB CODE
PRICE TO PAY
BILL TO
REQUIRED WORKER RATING
D1
C1
TYPING
WORKER'S STANDARD RATE
CUSTOMER'S ACCOUNT
QUALITY: HIGH SPEED: N/A
D2
C2
TYPING
NO MORE THAN $15.00
1 MAIN ST. CITY, STATE
QUALITY: HIGH SPEED: N/A
502
504
532
534
536
538
540
TIME NEEDED
OTHER REQUIRED WORKER CHARACTERISTICS
SECTIONS MUST GO TO MULTIPLE WORKERS?
SECTION IDENTIFIER(S)
DOCUMENT COMPLETED
DEC. 31, 1999
EXPERIENCE WITH COMPLEX EQUATION EDITING
YES
S1, S2
7:14 PM EST DEC. 21, 1999
BEFORE 5:00 PM EST, JAN. 25, 2000
NONE
NO
S3, S4, S5
INCOMPLETE
502
504

FIG. 5

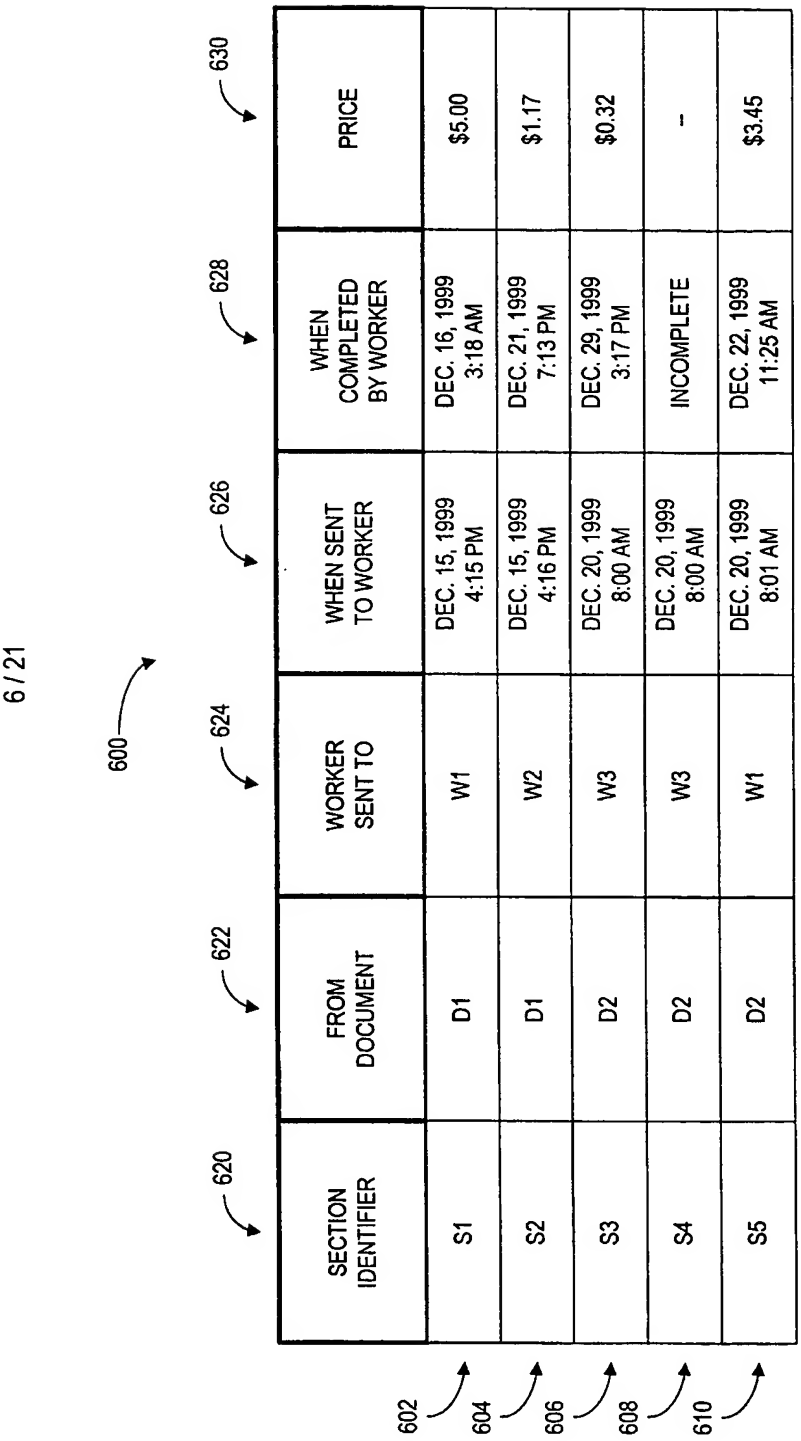

6 / 21
600
620
622
624
626
628
630
SECTION IDENTIFIER
FROM DOCUMENT
WORKER SENT TO
WHEN SENT TO WORKER
WHEN COMPLETED BY WORKER
PRICE
S1
D1
W1
DEC. 15, 1999 4:15 PM
DEC. 16, 1999 3:18 AM
$5.00
S2
D1
W2
DEC. 15, 1999 4:16 PM
DEC. 21, 1999 7:13 PM
$1.17
S3
D2
W3
DEC. 20, 1999 8:00 AM
DEC. 29, 1999 3:17 PM
$0.32
S4
D2
W3
DEC. 20, 1999 8:00 AM
INCOMPLETE
-
S5
D2
W1
DEC. 20, 1999 8:01 AM
DEC. 22, 1999 11:25 AM
$3.45
602
604
606
608
610

FIG. 6

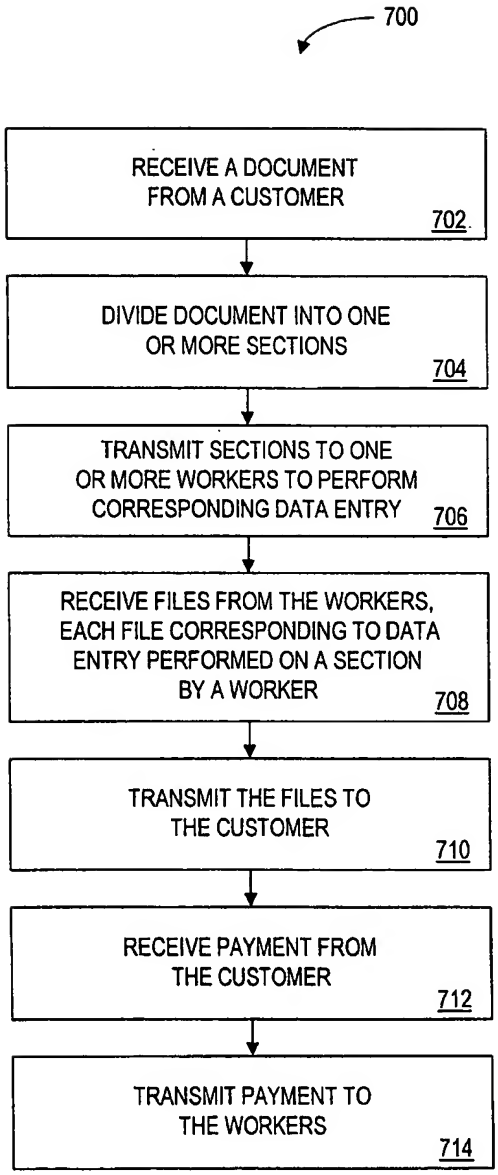

700
RECEIVE A DOCUMENT FROM A CUSTOMER
702
DIVIDE DOCUMENT INTO ONE OR MORE SECTIONS
704
TRANSMIT SECTIONS TO ONE OR MORE WORKERS TO PERFORM CORRESPONDING DATA ENTRY
706
RECEIVE FILES FROM THE WORKERS, EACH FILE CORRESPONDING TO DATA ENTRY PERFORMED ON A SECTION BY A WORKER
708
TRANSMIT THE FILES TO THE CUSTOMER
710
RECEIVE PAYMENT FROM THE CUSTOMER
712
TRANSMIT PAYMENT TO THE WORKERS
714

FIG. 7

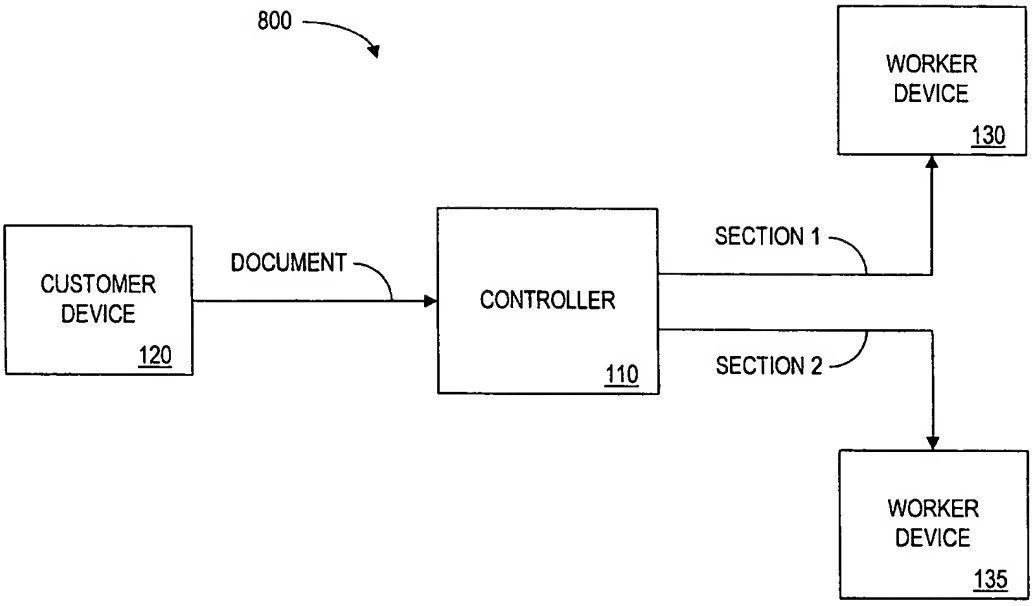

800
WORKER DEVICE
130
CUSTOMER DEVICE
120
DOCUMENT
CONTROLLER
110
SECTION 1
SECTION 2
WORKER DEVICE
135

FIG. 8

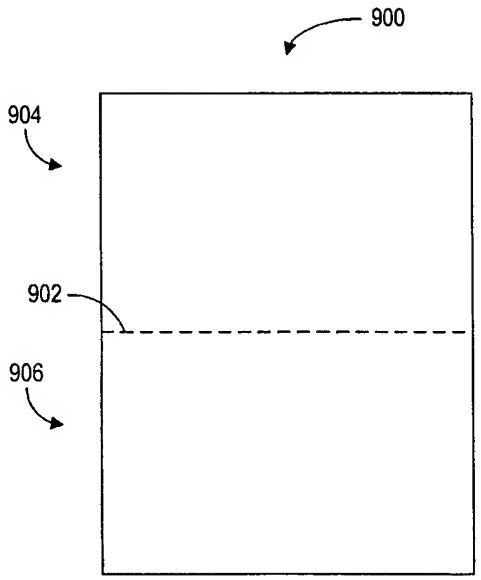



FIG. 9A

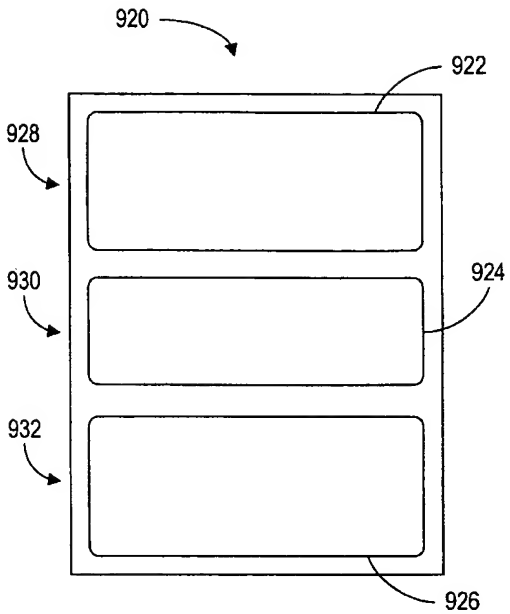



FIG. 9B

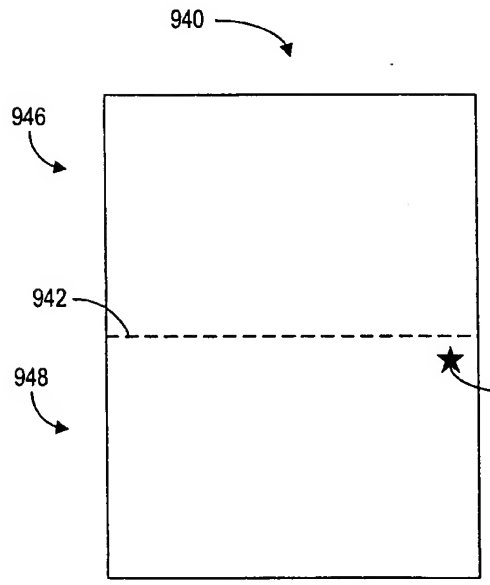



FIG. 9C

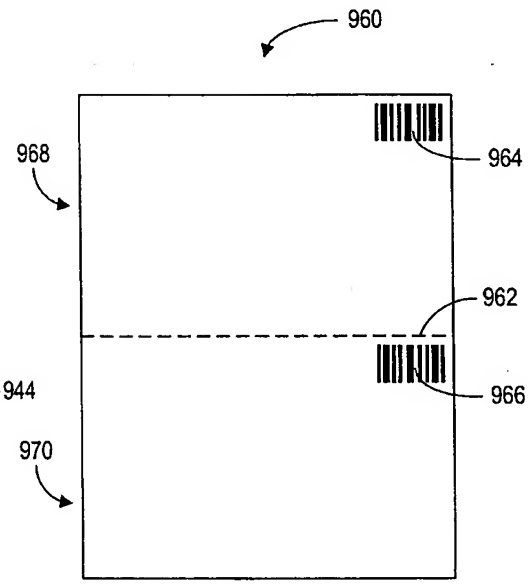



FIG. 9D

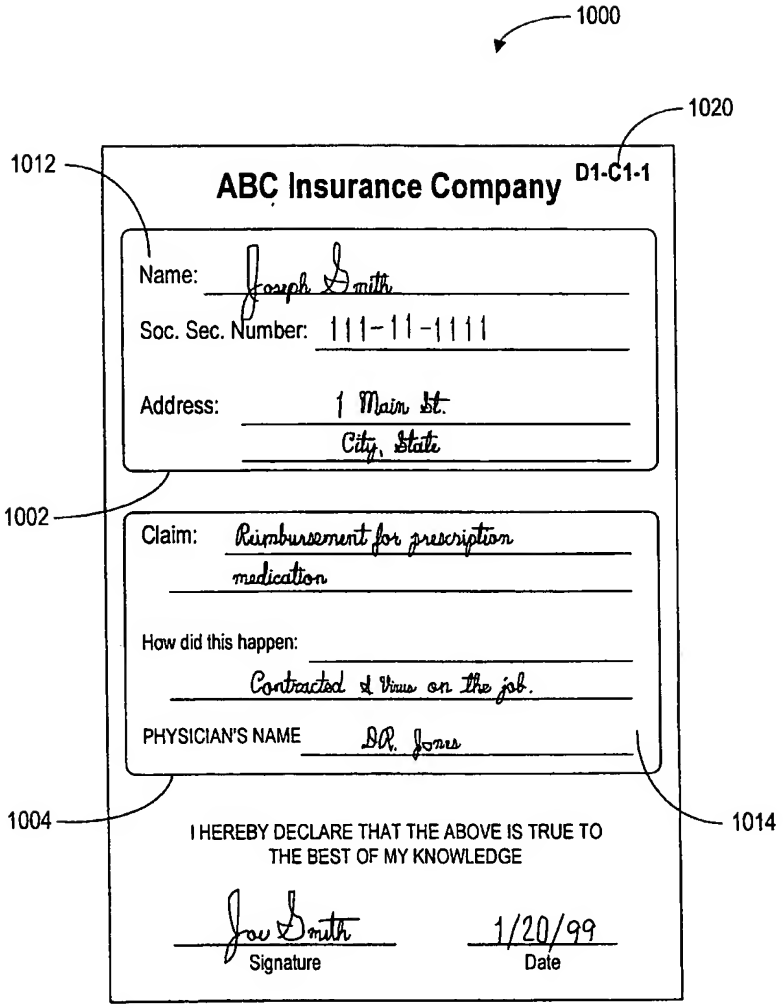

1000
1020
1012
ABC Insurance Company
D1-C1-1
Name: Joseph Smith
Soc. Sec. Number: 111-11-1111
Address: 1 Main St.
City, State
1002
Claim: Reimbursement for prescription medication
How did this happen:
Contracted a Virus on the job.
PHYSICIAN'S NAME Dr. Jones
1004
1014
I HEREBY DECLARE THAT THE ABOVE IS TRUE TO THE BEST OF MY KNOWLEDGE
Joe Smith
Signature
1/20/99
Date

FIG. 10

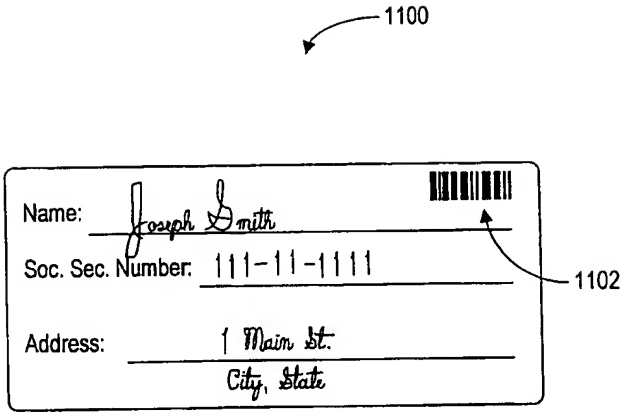

1100
Name: Joseph Smith
Soc. Sec. Number: 111-11-1111
Address: 1 Main St.
City, State
1102

FIG. 11A

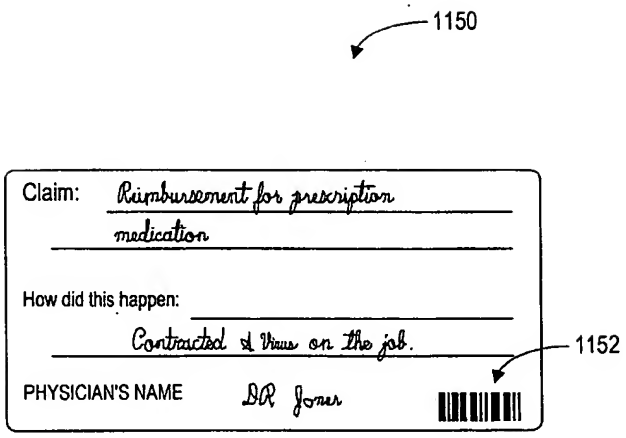

1150
Claim: Reimbursement for prescription medication
How did this happen:
Contracted a Virus on the job.
1152
PHYSICIAN'S NAME DR Jones

FIG. 11B

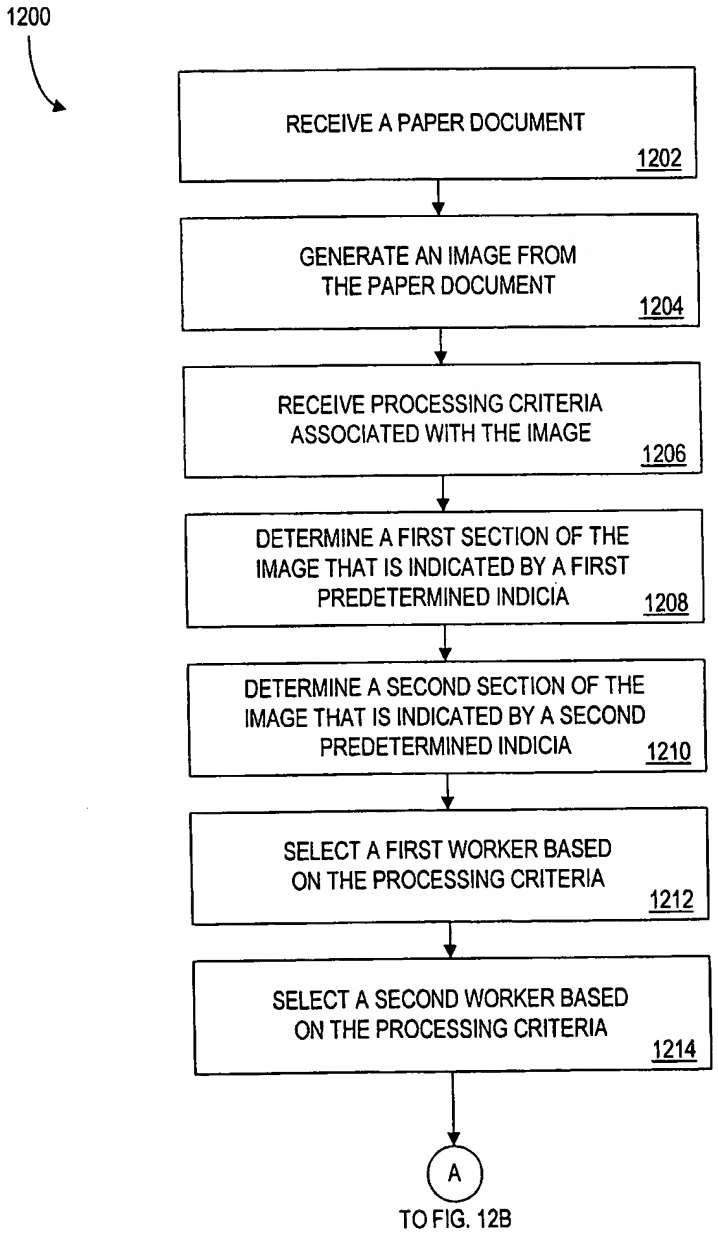

1200
RECEIVE A PAPER DOCUMENT
1202
GENERATE AN IMAGE FROM THE PAPER DOCUMENT
1204
RECEIVE PROCESSING CRITERIA ASSOCIATED WITH THE IMAGE
1206
DETERMINE A FIRST SECTION OF THE IMAGE THAT IS INDICATED BY A FIRST PREDETERMINED INDICIA
1208
DETERMINE A SECOND SECTION OF THE IMAGE THAT IS INDICATED BY A SECOND PREDETERMINED INDICIA
1210
SELECT A FIRST WORKER BASED ON THE PROCESSING CRITERIA
1212
SELECT A SECOND WORKER BASED ON THE PROCESSING CRITERIA
1214
A
TO FIG. 12B

FIG. 12A

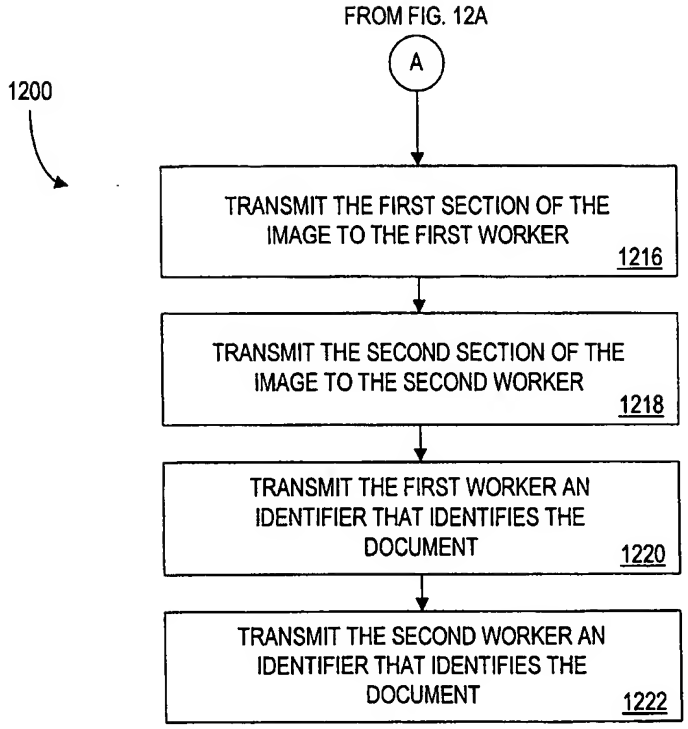

FROM FIG. 12A
A
1200
TRANSMIT THE FIRST SECTION OF THE IMAGE TO THE FIRST WORKER
1216
TRANSMIT THE SECOND SECTION OF THE IMAGE TO THE SECOND WORKER
1218
TRANSMIT THE FIRST WORKER AN IDENTIFIER THAT IDENTIFIES THE DOCUMENT
1220
TRANSMIT THE SECOND WORKER AN IDENTIFIER THAT IDENTIFIES THE DOCUMENT
1222

FIG. 12B

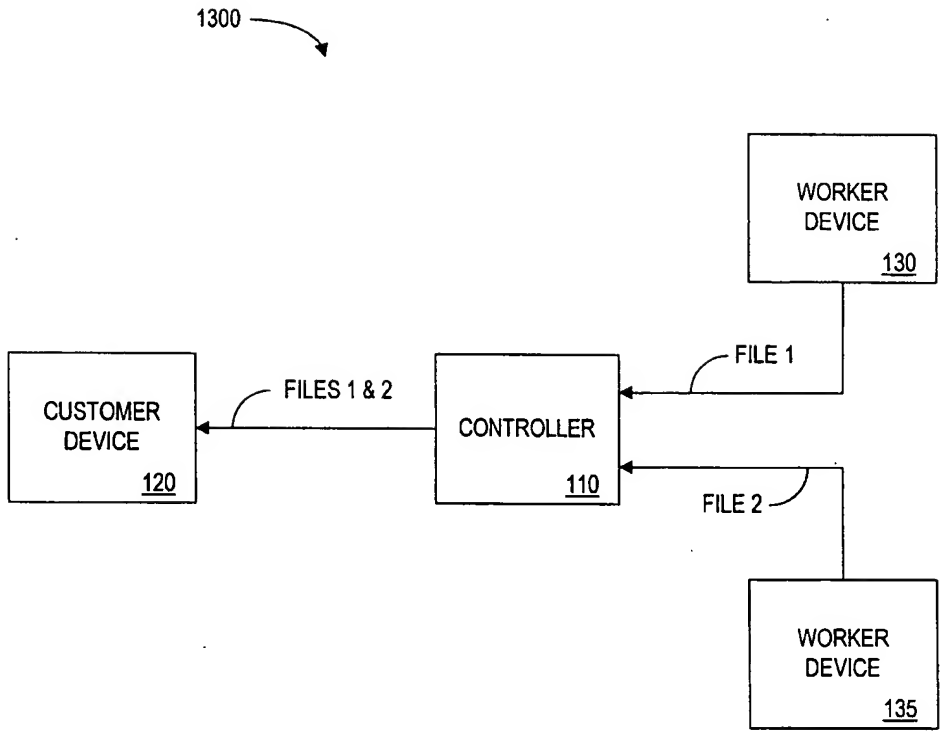

1300
WORKER DEVICE 130
FILE 1
FILES 1 & 2
CUSTOMER DEVICE 120
CONTROLLER 110
FILE 2
WORKER DEVICE 135

FIG. 13

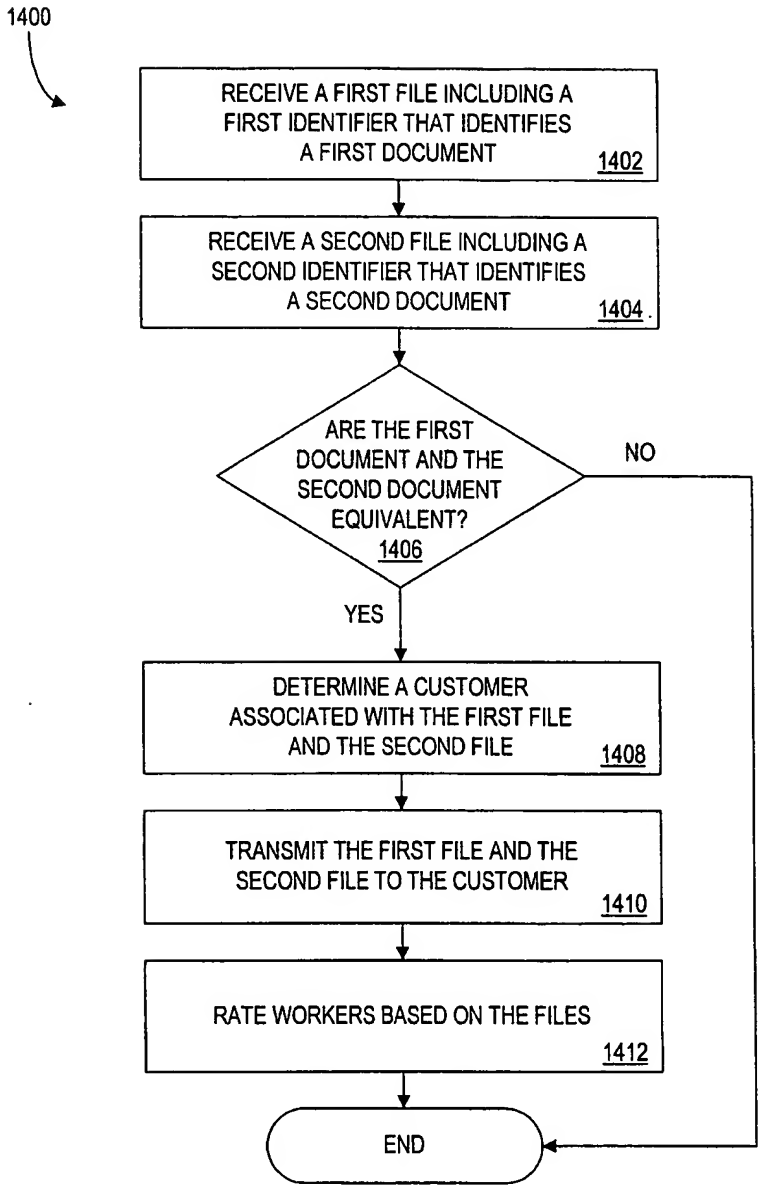

1400
RECEIVE A FIRST FILE INCLUDING A FIRST IDENTIFIER THAT IDENTIFIES A FIRST DOCUMENT
1402
RECEIVE A SECOND FILE INCLUDING A SECOND IDENTIFIER THAT IDENTIFIES A SECOND DOCUMENT
1404
ARE THE FIRST DOCUMENT AND THE SECOND DOCUMENT EQUIVALENT?
1406
NO
YES
DETERMINE A CUSTOMER ASSOCIATED WITH THE FIRST FILE AND THE SECOND FILE
1408
TRANSMIT THE FIRST FILE AND THE SECOND FILE TO THE CUSTOMER
1410
RATE WORKERS BASED ON THE FILES
1412
END

FIG. 14

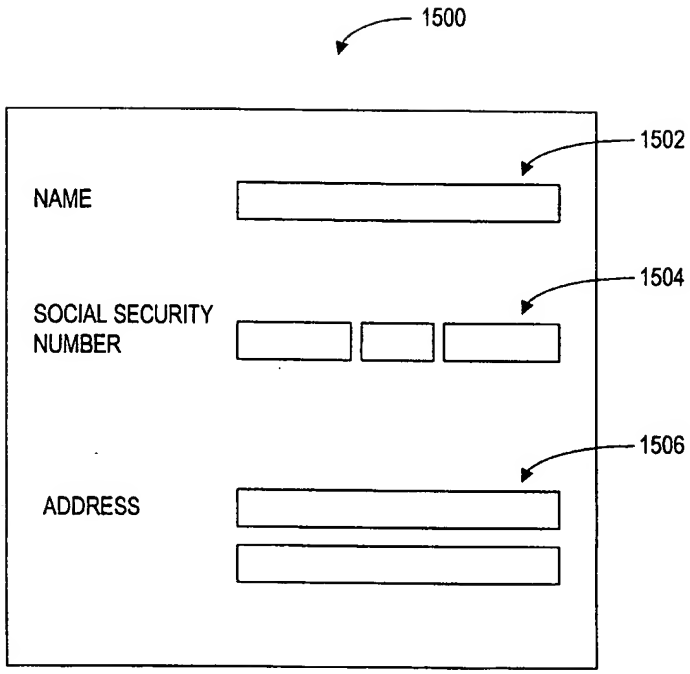



FIG. 15

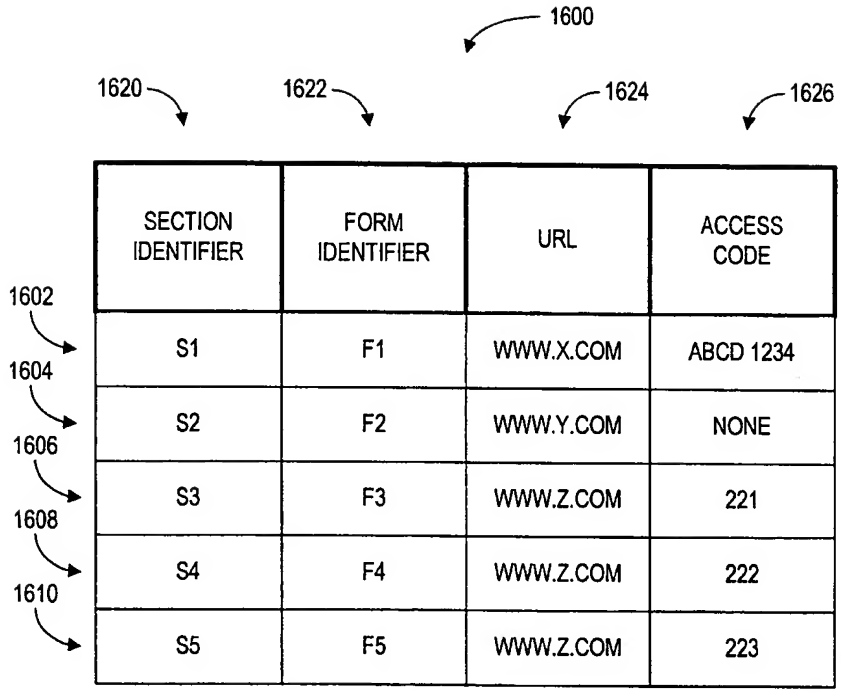

1600
1620
1622
1624
1626
SECTION IDENTIFIER
FORM IDENTIFIER
URL
ACCESS CODE
1602
S1
F1
WWW.X.COM
ABCD 1234
1604
S2
F2
WWW.Y.COM
NONE
1606
S3
F3
WWW.Z.COM
221
1608
S4
F4
WWW.Z.COM
222
1610
S5
F5
WWW.Z.COM
223

FIG. 16

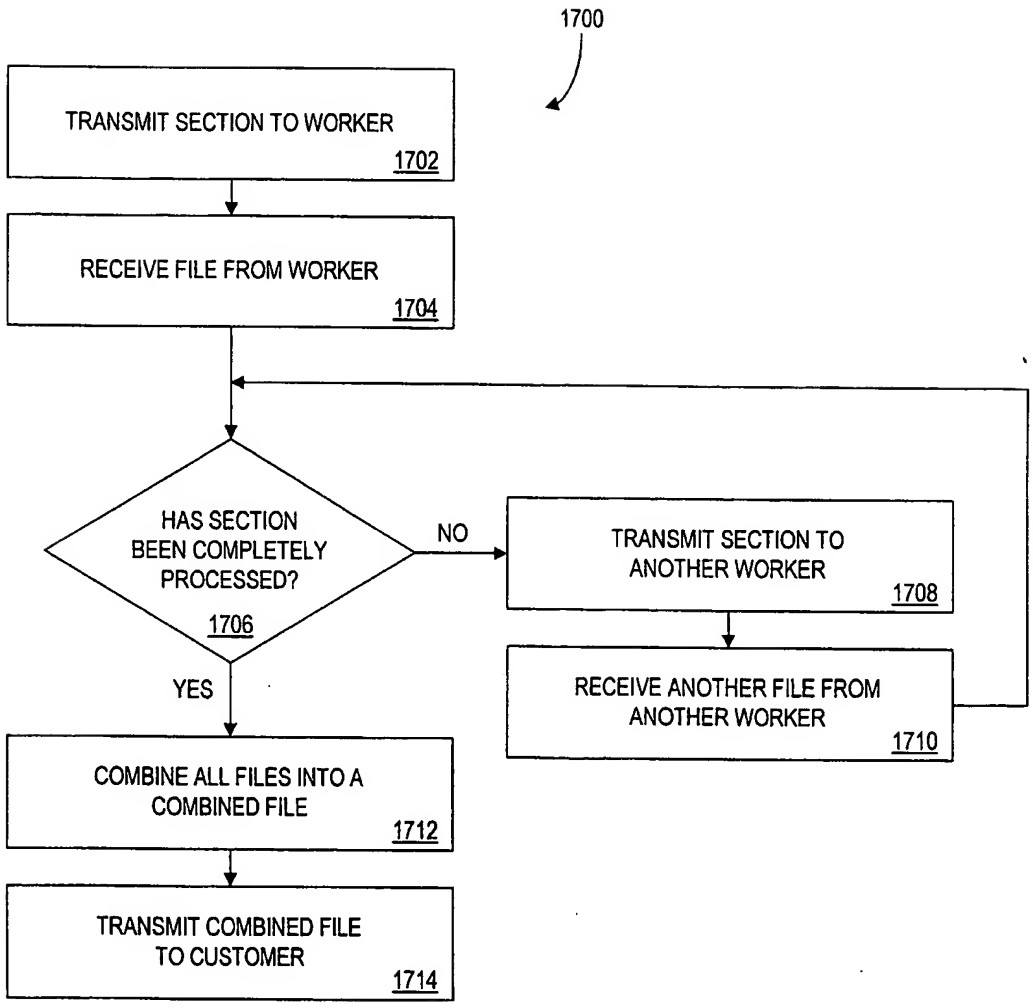

1700
TRANSMIT SECTION TO WORKER
1702
RECEIVE FILE FROM WORKER
1704
HAS SECTION BEEN COMPLETELY PROCESSED?
1706
NO
TRANSMIT SECTION TO ANOTHER WORKER
1708
RECEIVE ANOTHER FILE FROM ANOTHER WORKER
1710
YES
COMBINE ALL FILES INTO A COMBINED FILE
1712
TRANSMIT COMBINED FILE TO CUSTOMER
1714

FIG. 17

1800

1802

1804

| SECTION IDENTIFIER: S6 | | | | |
|---|---|---|---|---|
| FROM DOCUMENT: D3 | | | | |
| WORKER SENT TO 1820 | WHEN SENT TO WORKER 1822 | WHEN COMPLETED BY WORKER 1824 | PRICE 1826 | PERCENT COMPLETE 1828 |
| W1 | 7:18 AM 1/1/2000 | 8:53 PM 1/2/2000 | $1.50 | 50% |
| W2 | 12:03 PM 1/4/2000 | 4:03 AM 1/7/2000 | $0.75 | 25% |
| W3 | 9:15 PM 1/9/2000 | 8:03 AM 1/14/2000 | $0.75 | 25% |

1806

1808

1810

FIG. 18

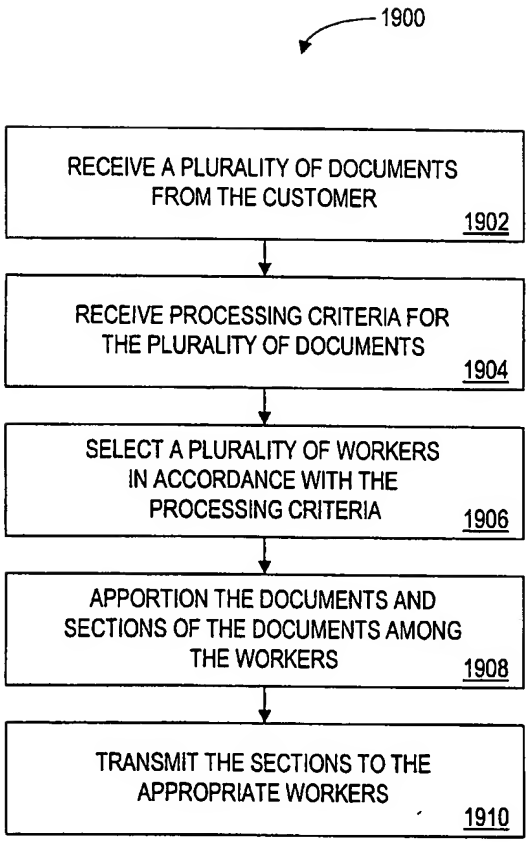

1900
RECEIVE A PLURALITY OF DOCUMENTS FROM THE CUSTOMER
1902
RECEIVE PROCESSING CRITERIA FOR THE PLURALITY OF DOCUMENTS
1904
SELECT A PLURALITY OF WORKERS IN ACCORDANCE WITH THE PROCESSING CRITERIA
1906
APPORTION THE DOCUMENTS AND SECTIONS OF THE DOCUMENTS AMONG THE WORKERS
1908
TRANSMIT THE SECTIONS TO THE APPROPRIATE WORKERS
1910

FIG. 19

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/15348

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06F 9/06, 12/02, 17/30
US CL : 705/7

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/9, 11; 707/1, 9, 10, 104, 200, 500, 539

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Please See Extra Sheet.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | US 5,678,046 A (CAHILL ET AL.)14 October 1997, the summary, background & figures (1, 5C) | 1-65 |
| Y | US 5,301,350 A (ROGAN ET AL.) 05 April 1994, the abstract & figures (1B, 2, 4B, 12A-12B, 14C-14D). | 31-35, 42, 50, 57, 65 |
| Y | US 5,225,978 A (PETERSEN ET AL.) 06 July 1993, the summary, abstract & figures (5-6). | 1-29 |
| Y | US 4,141,078 A (BRIDGES, JR. ET AL.) 20 February 1979, the summary of the invention, abstract & figures (9A, 13-22). | 1-65 |
| A | US 4,863,384 A (SLADE) 05 September 1989, the abstract & figures. | 1-65 |

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

| | | | |
|---|---|---|---|
| * | Special categories of cited documents: | "T" | later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention |
| "A" | document defining the general state of the art which is not considered to be of particular relevance | "X" | document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone |
| "E" | earlier document published on or after the international filing date | "Y" | document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "L" | document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "&" | document member of the same patent family |
| "O" | document referring to an oral disclosure, use, exhibition or other means | | |
| "P" | document published prior to the international filing date but later than the priority date claimed | | |

Date of the actual completion of the international search

22 SEPTEMBER 1999

Date of mailing of the international search report

21 OCT 1999

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

JAMES P. TRAMMELL James P. Trammell

Telephone No. (703) 305-9768

Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/15348

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | US 5,557,515 A (ABBRUZZESE ET AL.) 17 September 1996, the abstract, summary, & figures. | 1-65 |
| A | US 4,509,123 A (VEREEN) 02 April 1985, the background & the summary of the invention. | 1-65 |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/15348

B. FIELDS SEARCHED
Documentation other than minimum documentation that are included in the fields searched:

Van Nostrand's Scientific Encyclodpdia 6th edition, 1983.
Young, "Mastering Microsoft Word for Windows, Version 2.0", Bybex Inc., 1990.
Microsoft Press, "Computer Dictionary", 3rd edition, 1997

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

APS, West1.0/Derwent, Non Patent Literature.
search terms: determin? or decid? or find?, section? or portion# or part#, file# or document#, transmit? or transfer? or sending#, password# or identifier# or code# or key?, indicia, job code#, worker#, rating# or rate?, customer#, select? or choos?, process? (3w) document#, confid? or assuran? or trust? or entrust?